INDIA
RUBBER WORLD

OUR
61st YEAR

A BILL BROTHERS PUBLICATION

FEBRUARY, 1950

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DETROIT

Everybody knows—

"IT'S BETTER WITH

Vulcan-3"

. . . . So we are expanding the production of Vulcan-3 as fast as we can, to keep pace with the growing demand for this superior H A F black . . . . *and it's growing by leaps and bounds . . . .*

GODFREY L. CABOT, INC.,
BOSTON 10, MASS.

Vulcan-3 Vulcan-3 Vulcan-3

CASH IN on all the advantages of Neoprene Type W

IN YOUR PLANT

- Improved storage stability
- Greater flexibility in compounding
- Improved processability

IN YOUR PRODUCTS

- Extremely low compression set
- Brilliant colors
- *plus* all the superiorities inherent in products made of neoprene.

Yes, in your plant the plasticity, scorching tendency and cure rate of Neoprene Type W will be practically unaffected by long storage. And Type W will prove to be the easiest working neoprene you've ever tried. It has ideal processing properties . . . on the mill it readily forms a smooth sheet in which compounding ingredients will disperse quickly and uniformly. Type W possesses excellent resistance to mill breakdown, too. Even at high temperatures, it doesn't stick to mill and calender rolls.

You will be pleased with the combination of fast curing characteristics and safety that can be obtained with the use of organic accelerators—with or without sulfur.

In Type W vulcanizates, you can obtain compression set lower than the best obtainable with natural rubber. Through proper compounding this superiority can be maintained even at 212° F. Don't forget, too, that with Type W, brilliantly colored vulcanizates can be made which compare favorably with those of natural rubber.

So be sure you've investigated *all* the advantages this entirely new kind of neoprene offers. Samples are available on request.

E. I. du Pont de Nemours & Co. (Inc.), Rubber Chemicals Division, Wilmington 98, Delaware.

● For complete information on Neoprene Type W, see Report 49-3. Ask for your copy if you haven't received one. See your Du Pont representative or send us your request.

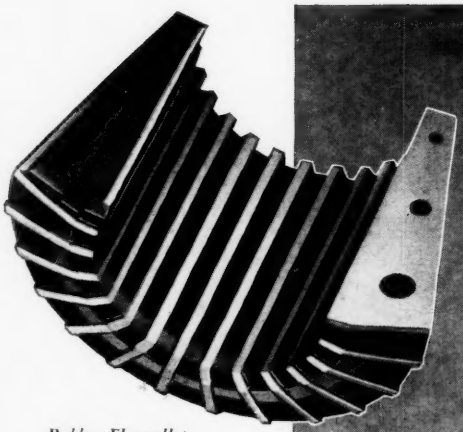
DU PONT RUBBER CHEMICALS

E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Del.

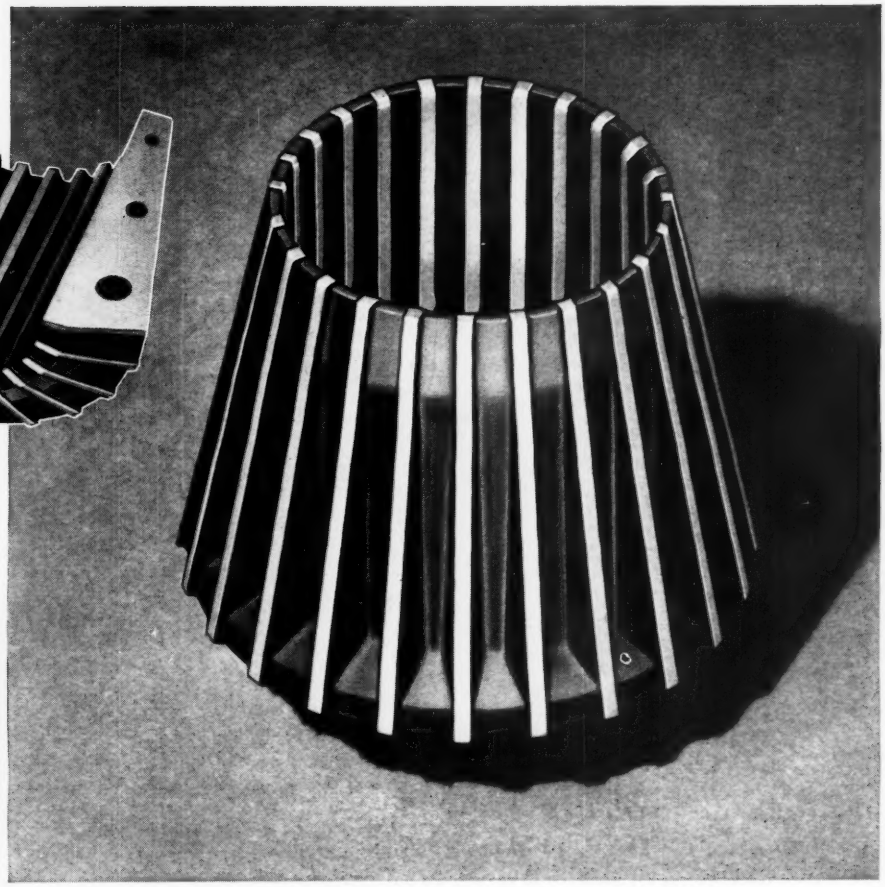
DU PONT

BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY

INDIA RUBBER WORLD, February, 1950, Vol. 121, No. 5 Published Monthly by BILL BROTHERS PUBLISHING CORP., Office of Publication, Orange, Conn., with Editorial and Executive Offices at 386 Fourth Avenue, New York 16, N. Y., U.S.A. Entered as Second Class Matter at the Post Office at Orange, Conn., under the act of March 3, 1879. Subscription United States and Mexico, $3.00 per year; Canada $4.00; All other Countries $5.00; Single Copies 35 cents. Address Mail to New York Office.



Rubber-Flex collet made by The Jacobs Manufacturing Co., Hartford, Conn.



Does the work of 8 collets ...with HYCAR'S help!

MEN who know lathes say the new Jacobs Spindle Nose Lathe Collet Chuck is a world-beater. And one of the important reasons for its success is the Rubber-Flex collet—in which Hycar American rubber is a vital part.

This collet, pictured above, is made of hardened steel jaws bonded and mechanically locked together with Hycar. Each collet has a full ⅛" gripping capacity—making it possible for one Rubber-Flex collet to cover the range of eight split steel collets!

Here's why Hycar is fundamental in the chuck design: the rubber in the collet has to have excellent resistance to heat and to the deteriorating effects of coolants and cutting compounds. On both counts, Hycar fills the bill perfectly.

Another important point: Hycar's resistance to compression set makes it possible for the molded rubber to take *all* of the flexing action. Under tests—over four million individual openings and closings—there was no breakdown in the Hycar rubber or separation from the steel collet jaws. You can see what that means in long collet life under heavy duty use.

Use of Hycar in this unusual collet is another in a long series of product successes. For versatile Hycar is used as a base material . . . as a plasticizer for polyvinyl resins . . . as a modifier for phenolic resins . . . as an adhesive base . . . as a latex for coating or impregnating. Find out how Hycar may help you develop or improve products, profitably. Just write Dept. HC-1, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio.

Hycar
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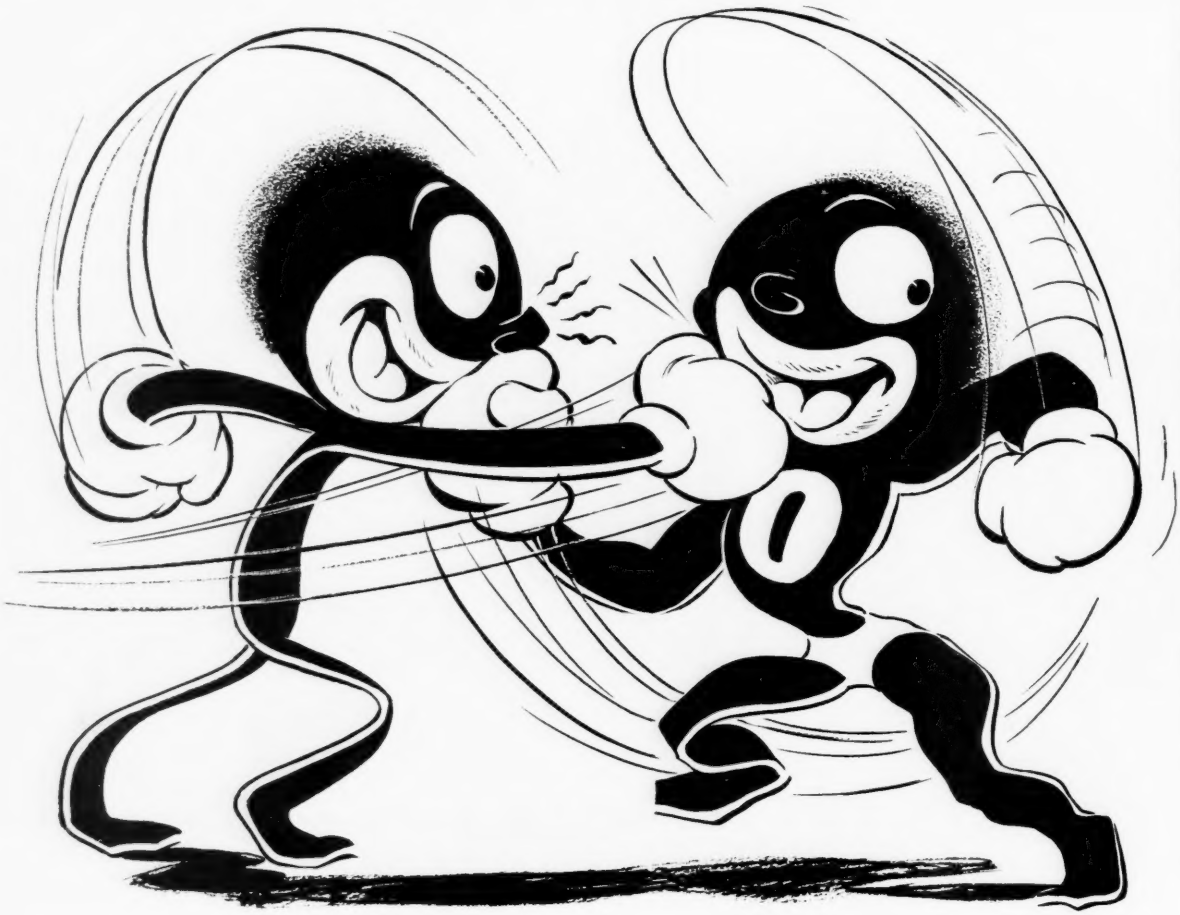
American Rubber

B. F. Goodrich Chemical Company
A DIVISION OF THE B. F. GOODRICH COMPANY

GEON polyvinyl materials • HYCAR American rubber • GOOD-RITE chemicals and plasticizers



To make tires tough, keep prices low—

Mix Philblack* A *with* Philblack* O!

They're well matched for championship performance! Philblack A has the edge in improving physical characteristics. He does an excellent job of dissipating heat. And . . . he saves you money! But Philblack O is the champion when it comes to long flex life and high resistance to abrasion.

Together, Philblack A and Philblack O make an unbeatable combination for producing low-cost, cool-running, longer-lasting tires! Order these versatile blacks in bags or in bulk. Always uniform in quality!

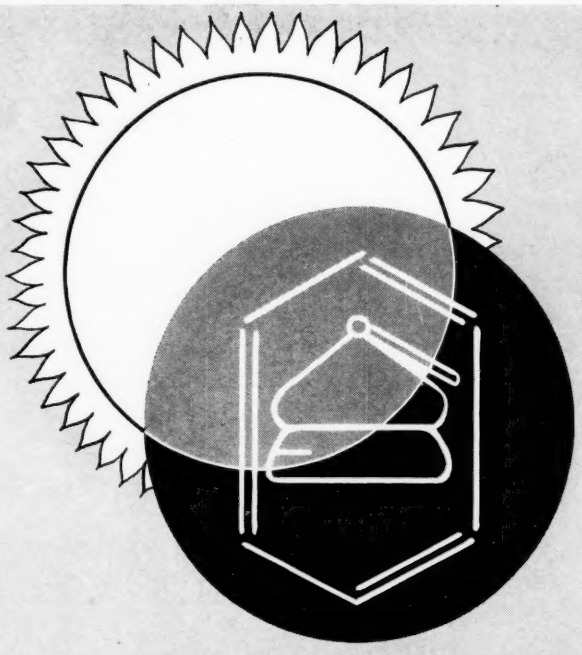
PHILLIPS CHEMICAL COMPANY

PHILBLACK SALES DIVISION

EVANS BUILDING · AKRON 8, OHIO

Warehouses in Akron, Boston, Chicago and Trenton. West Coast agent: Harwick Standard Chemical Company, Los Angeles. Canadian agent: H. L. Blachford, Ltd., Montreal and Toronto.

*A Trademark



Causes and Remedies

of Atmospheric Cracking

For over 20 years NAUGATUCK has been in the lead in developing, producing and testing Sunproofing Compounds to prevent atmospheric cracking.

This experience is available to you in three types of protective waxes:

SUNPROOF REGULAR
SUNPROOF IMPROVED
SUNPROOF JUNIOR

These are all scientifically blended mixtures which give year-round protection against atmospheric deterioration, particularly ozone.

If you are using or testing Sunproofs, read our Compounding Research Report Number 12.

A complete discussion of causes and remedies of atmospheric cracking.

PROCESS • ACCELERATE • PROTECT *with*

NAUGATUCK CHEMICALS

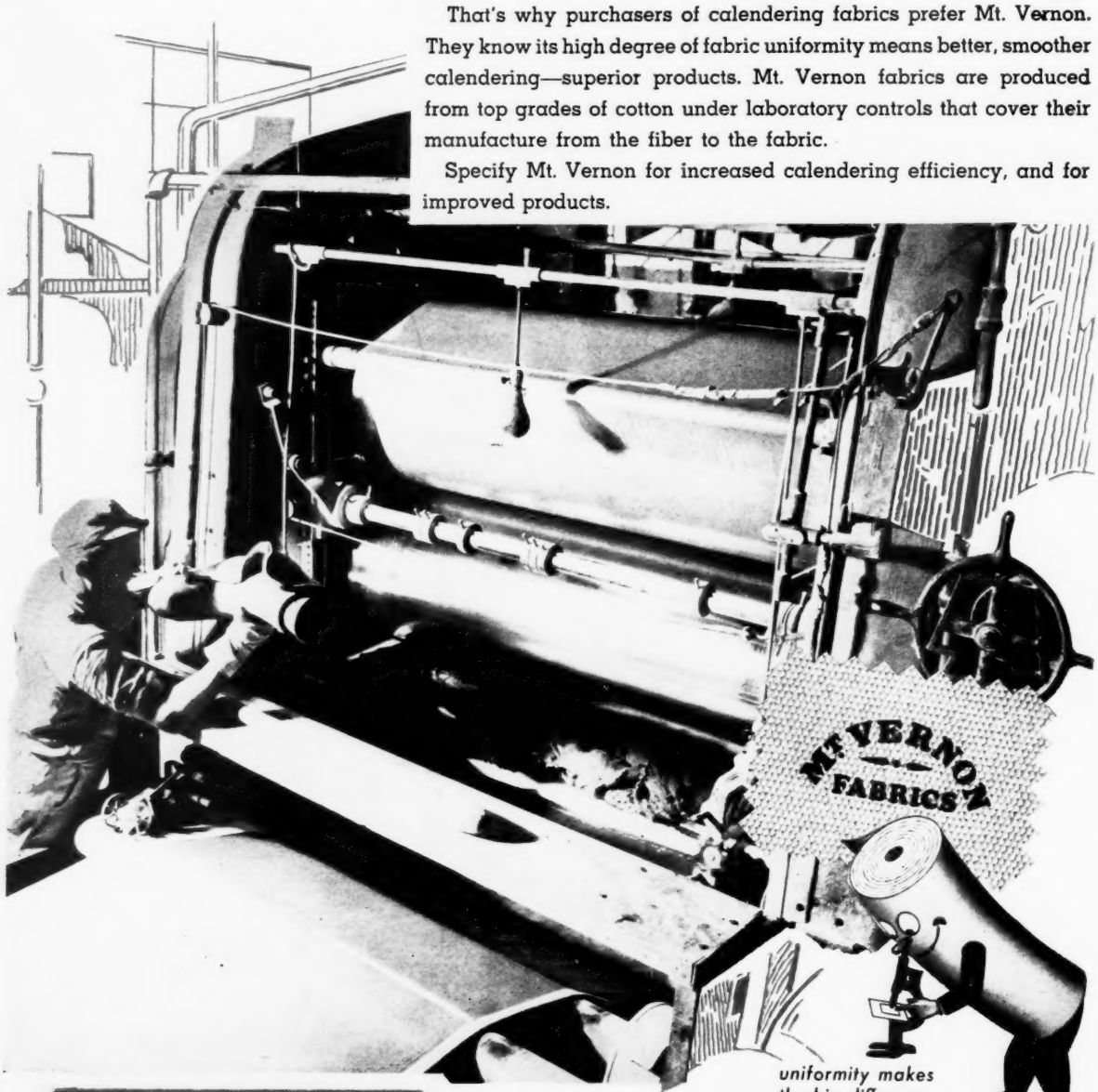
Naugatuck Chemical
Division of United States Rubber Company
NAUGATUCK • CONNECTICUT

Put Mt. Vernon On Your Calendar For Better Calendering

The smooth, continuous operation of your calendering machines depends to a large extent on the quality of the fabric you use.

That's why purchasers of calendering fabrics prefer Mt. Vernon. They know its high degree of fabric uniformity means better, smoother calendering—superior products. Mt. Vernon fabrics are produced from top grades of cotton under laboratory controls that cover their manufacture from the fiber to the fabric.

Specify Mt. Vernon for increased calendering efficiency, and for improved products.



uniformity makes the big difference

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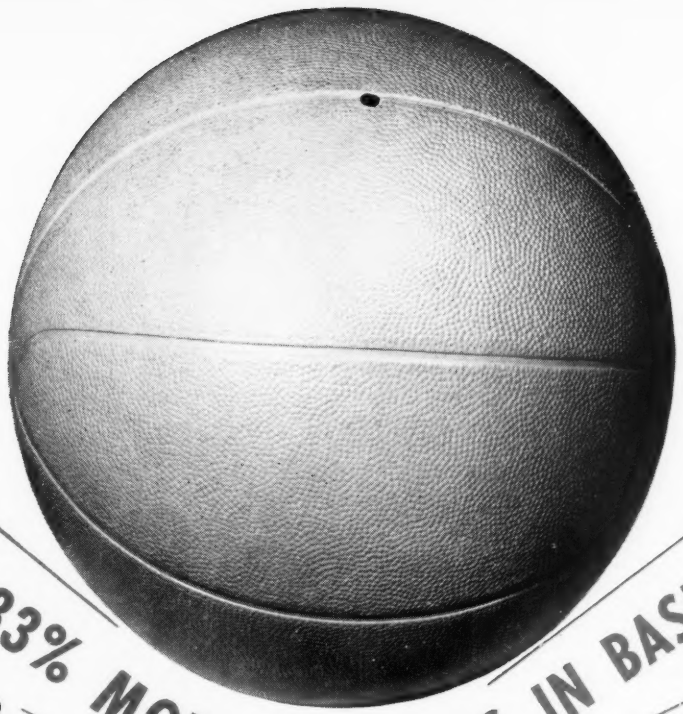
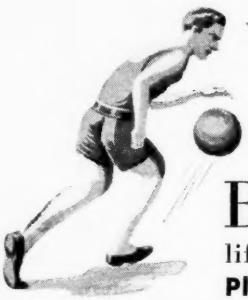


IT PUTS 233% MORE BOUNCES IN BASKETBALLS!



BASKETBALL cover stocks, too, enjoy added flex-life when reinforced by **Pliolite S-6.**

Tests showed that a typical rubber-covered basketball failed from flex-fatigue after 18,000 cycles that compressed it one-third. When **Pliolite S-6** was incorporated in the rubber stock, flex-fatigue life was increased up to 60,000 cycles — a jump of 233%.

Pliolite S-6 also improves abrasion resistance, keeping the ball looking better, longer. Laboratory tests prove weight loss through abrasion is 42% less when **Pliolite S-6** is added to the rubber stock.

Then, too, a well reinforced, light-gravity cover stock made with **Pliolite S-6** permits a better weight distribution throughout the ball.

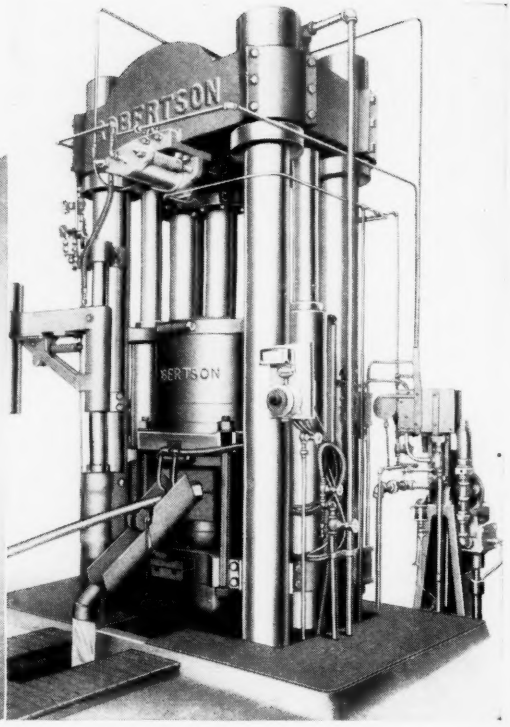
Pliolite S-6 is a superior colorless reinforcing material. It is well adapted to all compounds needing a light-color, low-gravity stock of 70-100 durometer hardness with good processing characteristics and moldability. Its reinforcement is positive — coupling extra hardness with negligible loss in elongation. Often elongation is improved.

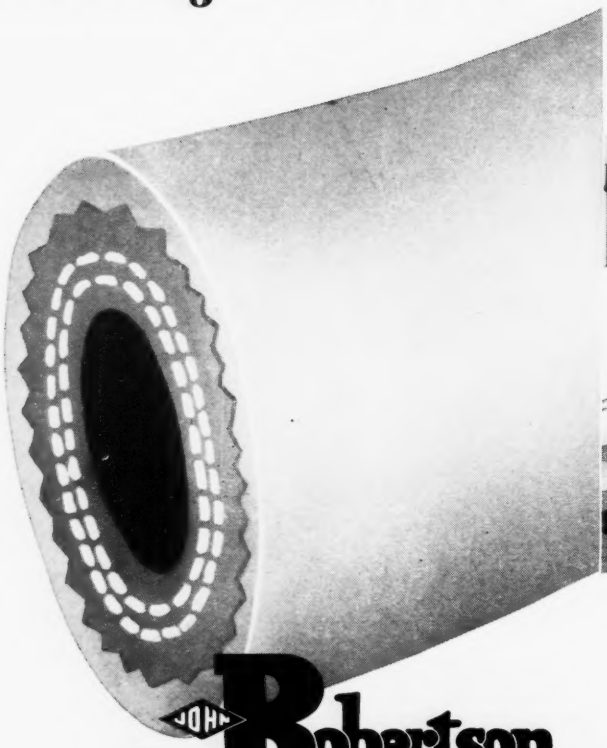
You'll find **Pliolite S-6** to be effective with GR-S, Neoprene, Buna N and natural rubber. It is available as a powder for your own mixing, or in master batches in whatever rubber you select. For complete information and sample, write: GOODYEAR, CHEMICAL DIVISION, AKRON 16, OHIO.

GOODYEAR

Pliolite—T.M. The Goodyear Tire & Rubber Company

Hose Lead Encasing Presses





by Robertson

GET YOUR FREE COPY of "Robertson Reminders", our informative pocket-size booklet published in your interest.

. . . consistently produce much of the world's finest rubber hose. Even though these "custom-built" machines turn out thousands and thousands of miles of hose, under the most rigid production schedules, every inch of hose receives a *close-fitting lead sheath of maximum density and uniformity.*

These end-results are due to Robertson's 92 years' experience in designing and manufacturing the finest high pressure hydraulic equipment . . . used by leaders throughout the world. If you have a hose lead encasing problem, consult Robertson Engineers with no obligation.

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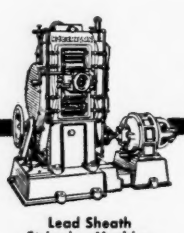
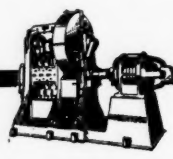
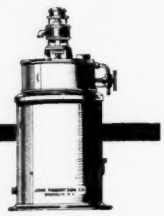
COMPANY INCORPORATED
131 WATER STREET, BROOKLYN 1, NEW YORK
Designers and Builders of all Types of Lead Encasing Machinery
Since 1858


Lead Sheath Stripping Machine


Hydraulic Pump


Melting Pot Open Lead

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PELLETEX

Carbon Black *Plus!*

When you buy PELLETEX, you buy more than carbon black. You purchase the assurance that whatever the quantity, PELLETEX quality will be uniformly high. The General Atlas trademark is a further guarantee that these SRF pellets will be outstanding for their high tensile strength, ease of processing, and excellent abrasion resistance.

Actual performance in rubber proves why PELLETEX has been the leader of carbon blacks since 1928.

CABOT **The GENERAL ATLAS Carbon Co.**

77 FRANKLIN STREET, BOSTON 10, MASS.

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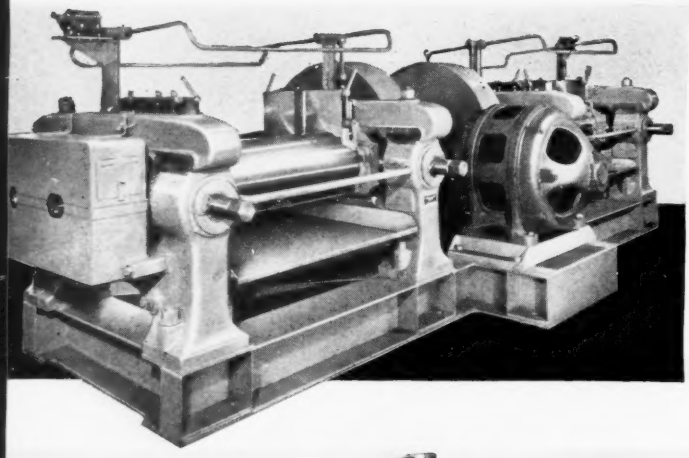
ADAMSON UNITED COMPANY

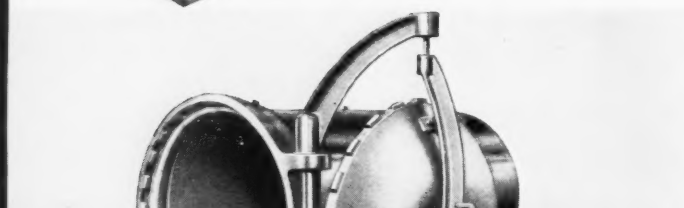
AKRON 4, OHIO

Plastics and R



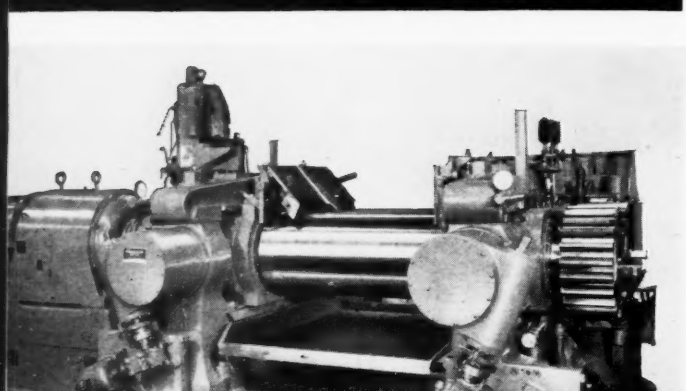
TWIN MILL UNIT

22" & 22" x 60" Mills designed and built for mixing and plasticizing an internationally known plastic material. The rolls operate in anti-friction bearings and the two Mills, together with right angle drive and motor, located between the units, are mounted on a continuous one-piece bedplate.



VULCANIZERS or AUTOCLAVES

Built in sizes ranging from 18 inches to 15 feet in diameter and any length, vertical or horizontal. Illustration shows a horizontal type with hinged, quick-opening door. Vulcanizers can be built to withstand internal pressures up to 1000 pounds per square inch. Write for our special bulletin



MIXING MILLS

These are built in all sizes from 6" x 16" to 28" x 84". The one illustrated is a late model (shown without gear enclosure), designed for plastics. It has rolls 20" in diameter by 48" long on the working face; flood lubricated roll boxes; tilting stock guides; motor-operated adjusting screws; stainless steel stock pan; dial indicators for front roll position; two sets of connecting gears for operating rolls at two different friction ratios, and an individual motor drive, with geared head and flexible coupling direct-connected to rear roll.

We can supply any size Mill driven individually; in pairs with right angle reducer between the units; or grouped on a line shaft with reducer at one end of the shaft.

Write for our new catalog covering Mills, Refiners, Crackers and Washers.

Designers and Builders of Basic Machinery for the Rubber, Plastics and Plywood Industries

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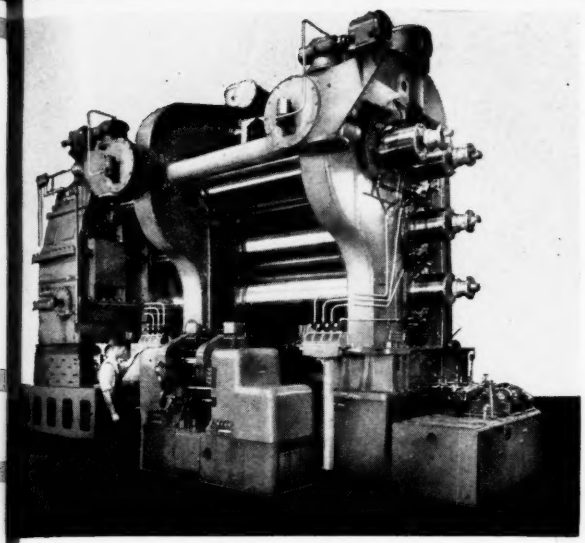


CALENDERS

The large Calender has four rolls measuring 36" in diameter by 92" long on their working faces. They are mounted in anti-friction bearings which are preset for precision operation at high temperature. Each roll is individually-driven from a separate gear stand. All bearings are flood lubricated from a central supply. The off-set, top and bottom rolls have individual motorized adjustment through double Cone worm reducers.

The small Calender in the foreground has four rolls measuring 8" in diameter by 16" long on their working faces. These rolls also operate in selected anti-friction bearings which are flood lubricated.

Each Calender is provided with motor and electric controls installed on flush mounted panels.

In addition to designing and building Calenders, we can supply all the processing equipment necessary for a complete operation. This includes plastic sheeting and the coating of fabrics with plastic or rubber compounds.

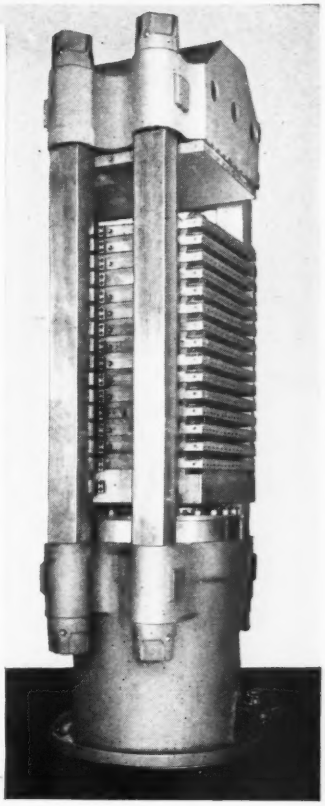
Write for our new calender catalog.

MULTIPLE DECK PRESSES

Multiple deck press with fifteen openings. This Press was constructed for extremely high pressures per square inch on the platens. We have standard designs for square platen presses in sizes varying from 12" x 12" to 60" x 60", and for Presses with oblong platens ranging from 12" x 14" to 70" x 84". Patterns and drawings are available for almost any size within the above two ranges but we are prepared to design and construct much larger ones.

These Presses can be built self-contained or for connection to existing hydraulic supply.

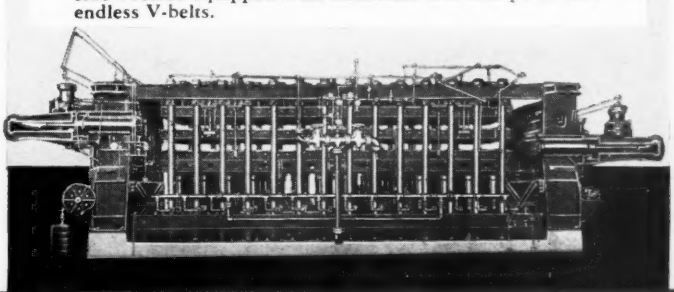
Write for our new catalog covering our full line of Hydraulic Presses.



BELT PRESSES

Belt Press with two openings. Platens are 63" wide by 31' long. This Press weighs over 300 tons and will deliver 250 lbs. per square inch on the platens. It comes complete with stretchers and clamps, the latter mechanically controlled directly from the movement of the platens. Standard designs for various sizes are available.

In addition to the above we also make a full line of open side Presses equipped with stretchers and clamps to cure endless V-belts.



ADAMSON UNITED PRODUCTS

- Mills
- Refiners
- Crackers
- Washers
- Rubber Sheeting & Coating Calenders
- Plastic Film Calenders
- Calender Wind-ups
- Calender Cooling Rolls
- Complete Calender Accessory Equipment
- Embossing Calenders
- Pot Heaters
- Vulcanizers
- Autoclaves
- Rotocure Machines
- Hydraulic Presses
- Multi-Platen Presses
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- Belt Curing Presses
- Compression Molding Presses
- Plywood Presses
- Auxiliary Equipment

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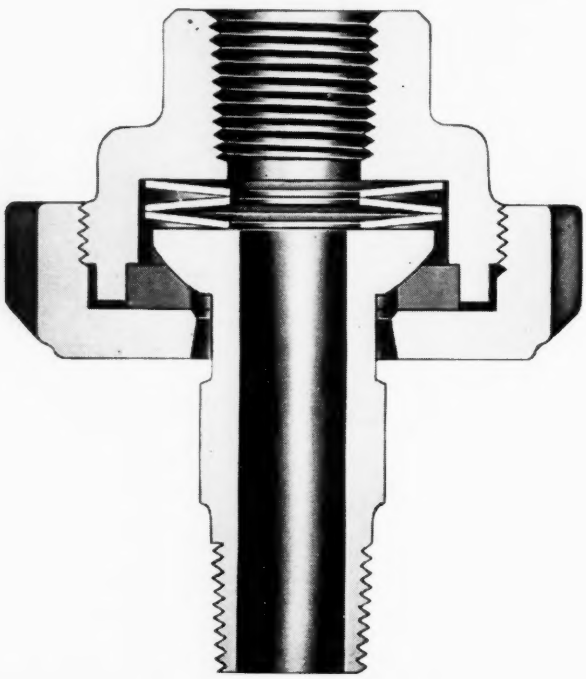
COMPANY. Plants at Pittsburgh, Vandergrift, New Castle, Youngstown, Canton

Improved Barco Rotary Swivel Joints
FOR MINIMUM FRICTION



FRICTION-FREE PERFORMANCE WITH LOWER TURNING TORQUE. This compact, lightweight, low cost joint is especially efficient at high and low temperatures and pressures. It handles alternating steam and cold water without leakage. It is much more compact for the same capacity and has performed successfully on continuous rotation applications up to 30 RPM. This new, low torque joint will greatly reduce power costs and worker fatigue. It is practically maintenance free.

WIDE TEMPERATURE AND PRESSURE RANGES. The new Barco Rotary Swivel Joints withstand these extreme ranges with complete safety, no chance of bursting. Angular motion compensates for misalignment and there is no restricted internal diameter as in flexible hose.

Install these remarkable joints now. Our engineers will gladly discuss your problems. Sizes ⅜", ½", ¾", 1". When ordering, give complete information about pressures, temperatures, fluids or gases, and any other special conditions.

BARCO ***FLEXIBLE JOINTS***

FREE ENTERPRISE—THE CORNERSTONE OF AMERICAN PROSPERITY

Not just a swivel joint ...but a combination of a swivel and ball joint with rotary motion and responsive movement through every angle.

"MOVE IN EVERY DIRECTION"

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An important announcement to all Rubber Molders:

GENERAL ELECTRIC

NOW OFFERS YOU

An improved, more efficient Silicone Release Agent to help you mold better products

A new General Electric silicone emulsion for use as a mold release agent in the rubber industry offers important advantages to users.

This new emulsion (G-E 81161) has been thoroughly tested in the laboratory. It has already been used commercially, and accepted, by the largest rubber manufacturers. The introduction of this improved emulsion was purposely withheld until everyone concerned with the evaluation of the product was satisfied that it was right *in every respect.*

Here are some of the special features that this new G-E silicone emulsion 81161 offers users:

1. **Superior mold coverage—better performance on intricate molds.**
2. **Exceptional stability at room temperatures and above—it remains stable up to 150 F.**
3. **Hard water stability; it remains stable *24 hours at 750 PPM* in ½% dilution.**
4. **Stability under mechanical working; won't break or cream under *repeated* recycling in centrifugal pumping system.**
5. **Will not stain light-colored stocks.**

G-E 81161 is suitable for mold spray or bag dip. It is rust-inhibited, it has low toxicity, and many other important advantages. We suggest you *try* it yourself—see in your own plant how you can turn out better molded products, cut rejects, and increase production by reducing mold down time for cleaning. Write today for more details. Address Section J1, Chemical Department, General Electric Company, Pittsfield, Massachusetts.

Silicones for Industry

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CD50-J1

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BUTYL INNER TUBES
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use—

WHITETEX

• FINE particle size white pigment. Brightness 90-92. GOOD reinforcing. Excellent *processing*.

»» SAMPLES SENT PROMPTLY ON REQUEST. ««

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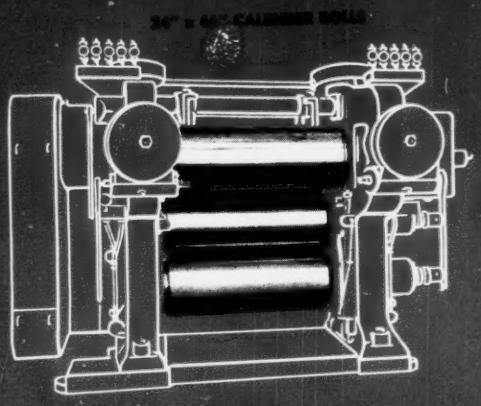
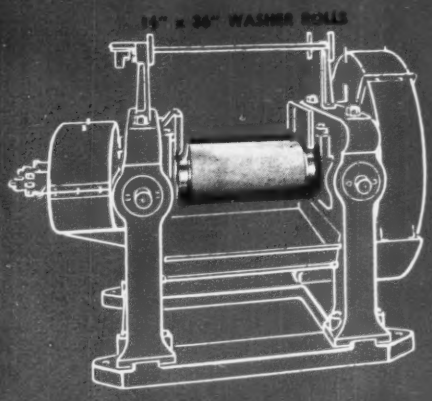
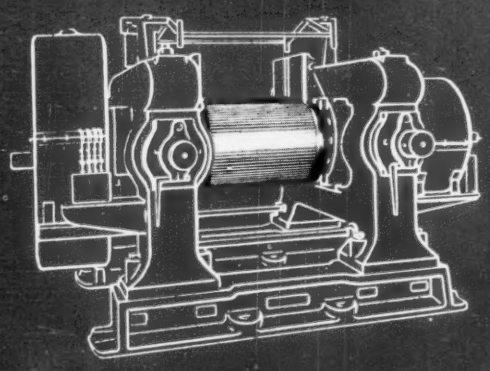
VORLD



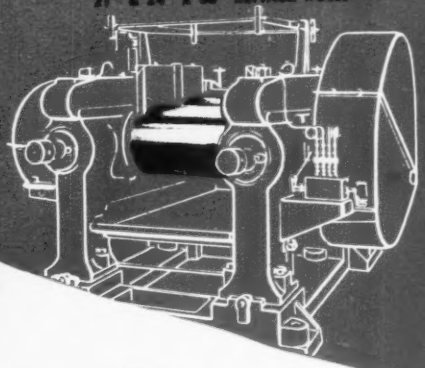
24" x 60" CALENDER ROLLS



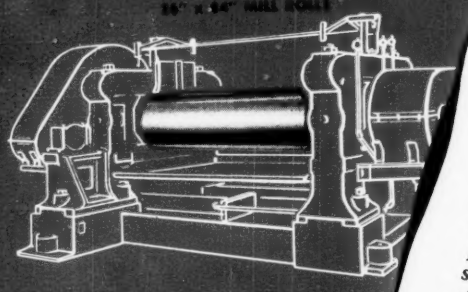
14" x 36" WASHER ROLLS



24" & 28" x 36" CRACKER ROLLS



21" & 24" x 36" REFINER ROLLS



16" x 24" MILL ROLLS

ROLLS THAT FIT INTO YOUR PLANS for improved processing efficiency

Farrel-Birmingham roll designs are the result of experience accumulated in designing and building a wide variety of processing equipment during a century of service to the rubber industry. These designs have kept abreast of, and in many cases anticipated, the roll needs of the industry.

Farrel-Birmingham rolls are produced in the *world's largest specialty roll shop* at Ansonia — a shop equipped to make rolls of any size required, and in many different metal formulas, of chilled iron, alloy iron, gray iron, Meehanite metal or steel.

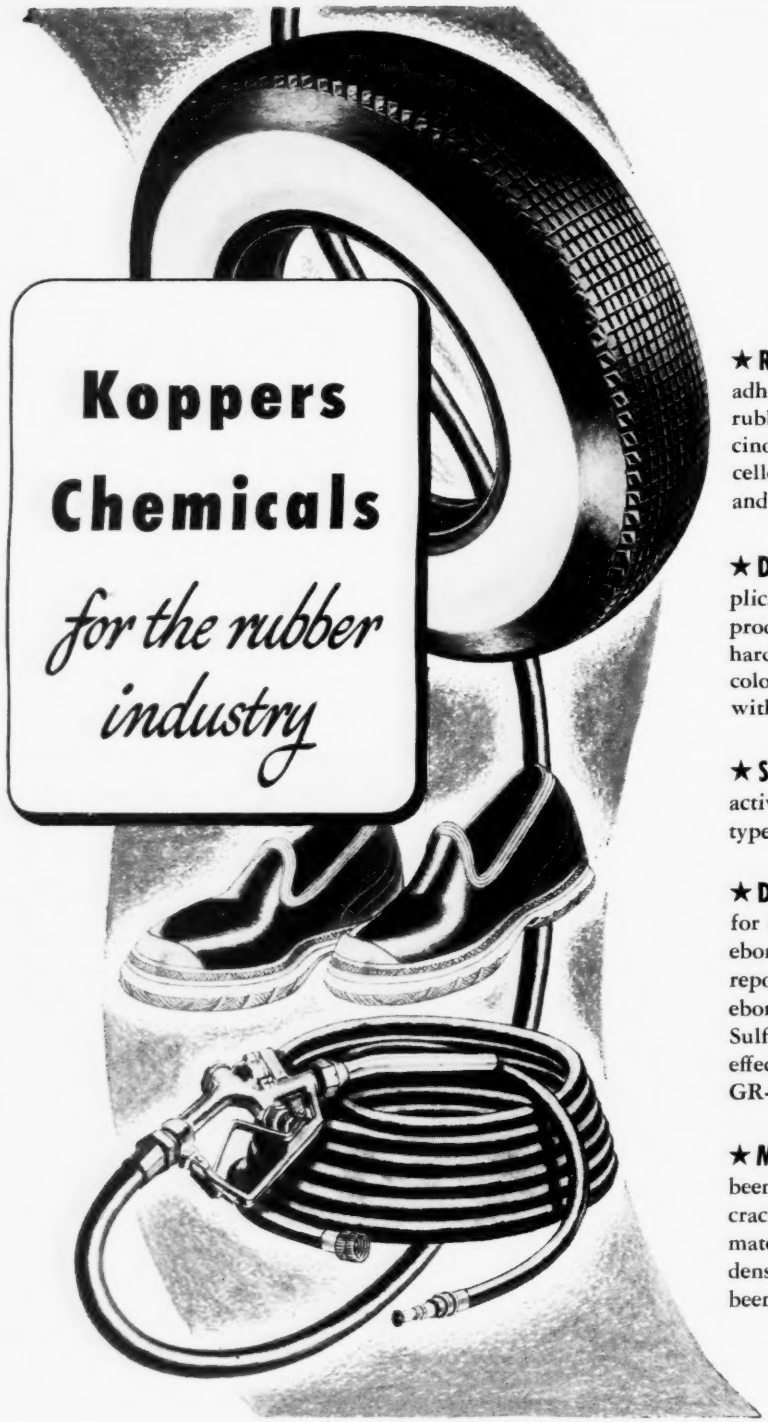
When you need roll renewals or other processing equipment, call on Farrel-Birmingham.

FARREL-BIRMINGHAM CO., INC.
ANSONIA, CONN.

Plants: Ansonia and Derby, Conn., Buffalo, N. Y.

Sales Offices: Ansonia, Buffalo, New York, Boston, Pittsburgh, Akron, Chicago, Los Angeles

Farrel-Birmingham



Koppers Chemicals *for the rubber industry*

★ **RESORCINOL** is used for preparation of adhesives that assure a strong bond between rubber and fabric or cords. Koppers Resorcinol used in pre-dip treatment produces excellent bonding of rubber to cotton, rayon and nylon fabrics.

★ **DI-tert-BUTYL-para-CRESOL** has wide application as an antioxidant in white rubber products. It retards cracking, checking, hardening or loss of strength without discoloring the product or staining materials with which the product comes in contact.

★ **STYRENE MONOMER** polymerizes with active olefinic compounds to produce GR-S type synthetic rubbers.

★ **DI-tert-BUTYL-meta-CRESOL** is suggested for use in the preparation of hard rubber or ebonite from GR-N synthetic rubbers. It is reported to improve tensile strength of ebonite and increase tackiness of the stock. Sulfides of DBMC have been reported to be effective peptizing agents for reclaiming of GR-S type synthetic rubbers.

★ **MONO-tert-BUTYL-meta-CRESOL** has been reported to be an effective anti-flex cracking agent in rubber and rubber-like materials. And the resin obtained by condensation of MBMC with formaldehyde has been shown to impart tack to GR-S rubber.

WRITE FOR INFORMATION ON THESE CHEMICALS

Koppers has prepared a new bulletin containing information and structural formulae on 26 synthetic chemicals offered in commercial quantities, including these five chemicals of special interest to the rubber industry. For your copy, write to Koppers Company, Inc., Chemical Division, Dept. IR-2, Pittsburgh 19, Pa. Ask for Bulletin C-9-103.

KOPPERS

KOPPERS COMPANY, INC.

Chemical Division

Pittsburgh 19, Pa.

DO YOU KNOW?

By Using BEMIS TITE-FIT TUBING

YOU

REDUCE labor and material costs, because you:

ELIMINATE handling heavy bales of burlap.

ELIMINATE time required to open bales and remove bale coverings.

ELIMINATE time required to cut burlap into sheets.

ELIMINATE using more burlap than necessary.

ELIMINATE all hand sewing.

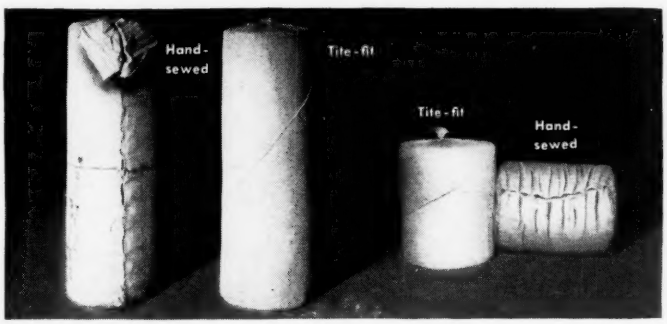
IMPROVE the appearance of your rolls.

YOUR CUSTOMERS

RECEIVE neat packages that are easy to handle, because there's a handy ear on each end.

SAVE TIME as TITE-FIT TUBING is easily and quickly removed. Just untwist wire tie at one end and slip tubing off.

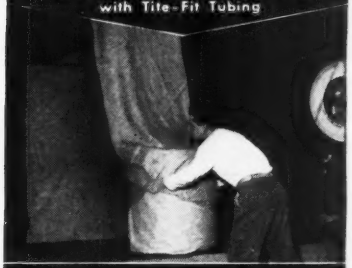
ELIMINATE chance of cutting into contents and damaging goods, as no cutting of sewing thread or goods is necessary.



This versatile tubing fits almost any shape and a wide range of package sizes. One roll may cover many different diameters and lengths neatly, without waste because TITE-FIT TUBING has *stretch* in both directions.

5 QUICK STEPS

That's all . . . when you package with Tite-Fit Tubing



1. Pull tube well down over object, leaving an overage to cover bottom.

2. Turn package on side and fasten tube at bottom with a wire tie.

3. Turn package upright and use both hands to take up slack.

4. Fasten top with a wire tie close to object to assure tight fit.

5. Cut off the Tite-Fit Tubing about 3 inches above the wire tie.

BEMIS BRO. BAG CO.

Brooklyn 32, New York

BEMIS BRO BAG COMPANY

MAIL COUPON NOW

Bemis Bro. Bag Co.
5134 Second Ave., Brooklyn 32, N. Y.

☐ Send descriptive folder on TITE-FIT TUBING

☐ Send sample. Our packages are approximately _____ inches in circumference. (Please specify)

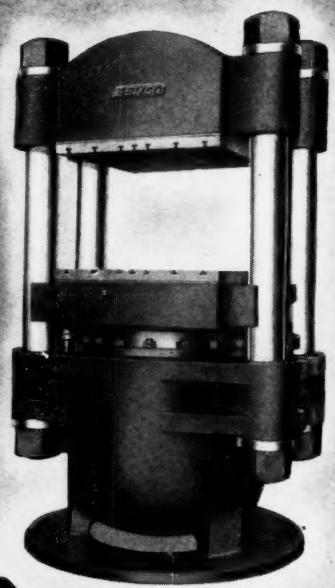
Name _____

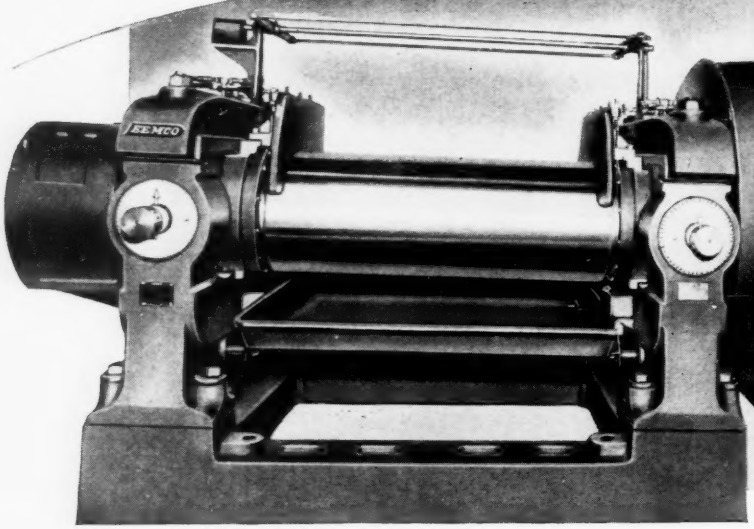
Firm _____

Street _____

City _____ *Zone* _____ *State* _____

GET EEMCO'S ESTIMATE BEFORE YOU BUY





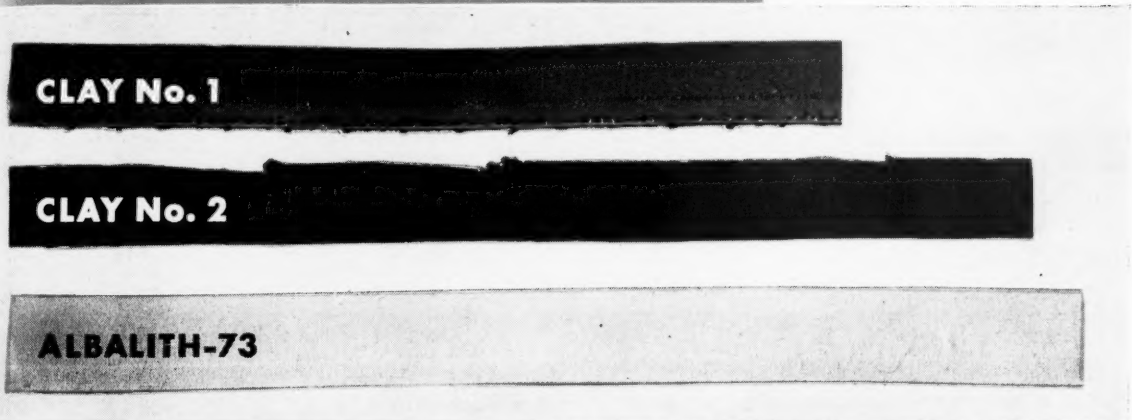
Yes, you will profit, as have many others, if you write to EEMCO for their proposition on Rubber and Plastics Processing Machinery. Engineered right, built right and of best obtainable materials you are assured of longer life and better production when you select EEMCO. If your present or future needs include any of the machines listed below, write EEMCO for a quotation. You will like their attractive prices and quicker deliveries. Standard and custom made, of course.

MILLS
PRESSES
REFINERS
CRACKERS
LABORATORY MILLS
LABORATORY PRESSES

EEMCO ERIE ENGINE & MFG. CO.
ERIE, PENNA.

RUBBER AND PLASTIC MACHINERY DIVISION

It's NEW!
It's a PROCESSING AID!
It's a REINFORCING PIGMENT!



Albalith-73 tubes faster and smoother than 2 representative clays, in a Butyl (GR-IR2) stock. The length of each of the above sections is proportional to the volume rate at which each was extruded.

ALBALITH-73

(The COATED Lithopone)

CUTS PROCESS COSTS
SPEEDS PRODUCTION
STEPS UP QUALITY

ALBALITH-73 — the special lithopone coated with fatty acids—is more than a reinforcing pigment; it is also a definite aid to processing. Compared with low-cost extender pigments, Albalith-73 mixes faster on the rolls . . . produces more plastic stocks that make for smoother, quicker tubing . . . and imparts better physical properties.

These properties of Albalith-73 are obvious from the above photograph and from the following table based on a Butyl (GR-IR2) compound—a synthetic of current interest for high-voltage wire and cable.

Why not test Albalith-73 in your compounds now?

PROPERTIES of ALBALITH-73 in BUTYL (GR-IR2)

PIGMENT	BATCH MILLING TIME* (Mins.)	WILLIAMS Plasticity (70°C.@ 3 min.)	WILLIAMS Recovery (1 min.)	MOONEY Viscosity (ML100°C.@ 3 min.)	½ ROYLE** EXTRUSIONS (CC/min.)	CURED COMPOUND Tensile (PSI)	CURED COMPOUND Elongation (%)
Albalith-73	41	2.27	.31	66.5	105.8	990	730
Clay #1	47	2.60	.39	88.0	80.6	715	480
Clay #2	54	3.23	.30	93.0	98.0	1030	540

COMPOUND

GR-IR2	100
Sulfur	2
P-Quinone Dioxime	2
Benzothiazyl Disulfide	4
Stearic Acid	2
Protox-166 Zinc Oxide	5
Pigment	50 vol./100 vol. Rubber

Cure: 15 minutes @ 320°F.
(Source: Enjay Butyl Wire Insulation Reports #1 and #2)

* Stocks were milled on a 6″ x 12″ laboratory mill with a starting roll temperature of 30°C.

** Royle Tuber Conditions:

Head Temp.	140°C.
Extension Temp.	105°C.
Cylinder Temp.	105°C.
Stock Screw Speed	50 RPM

HORSE HEAD PRODUCTS

THE NEW JERSEY ZINC COMPANY

Founded 1848

160 FRONT STREET • NEW YORK 7, N. Y.

RUBBER & PLASTICS MACHINERY BULLETIN

Reporting News and Machine Design Developments

IN BUSINESS TO **NRM** REDUCE YOUR COSTS

Maximum Efficiency Calls For Special Extruder Screws

There is no such thing as a "standard" extruder screw where maximum efficiency is demanded. That's why NRM sells so many screws for other makes of tubers. Many factors enter into screw selection: the compound to be extruded, the cross section, tolerance and desired production rates. Long experience and close observation of extruder performance throughout the rubber and plastics field provides NRM engineers with an accurate guide for designing screws for specific jobs.

Production Quality Depends on Design of Screw

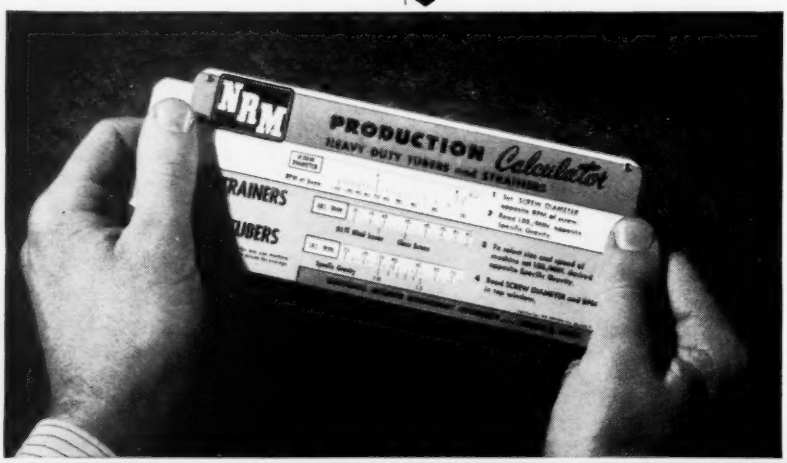
Rate, uniformity and density of the extrusion; horsepower consumed and heat generated in the stock are all affected by screw design and system of temperature control. These factors do not always have the same relation to each other due to variations in compounds. Therefore, selection of best screw characteristics is not an exact science, but depends largely on experience gained from working with many installations.

NRM offers you the benefit of such experience! Perhaps your present compounds are different than they were when you bought your extruders. It can pay you well to check the efficiency of your present screws. Consult with NRM—one of our many varieties may reduce your costs!

New Extrusion Production Calculator Available

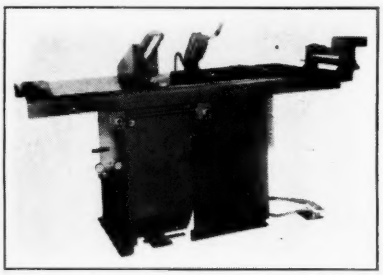
Now—NRM Engineers have developed a simple (see photo below) but accurate production calculator based on NRM extruder and strainer performance. With the calculator one can quickly determine output in lbs., horse power for various screw speeds taking into consideration the gravity of the stock.

To get your calculator write NRM in Akron Ohio (address below). Please use company letterhead and give title.



WELDSTITCH TUBE SPLICER For Industrial Tire Inner Tubes

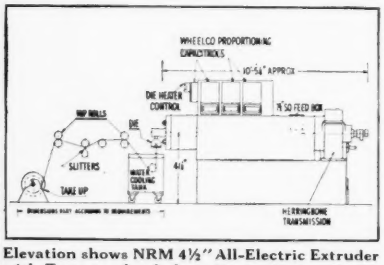
Industrial tire tubes are mostly still hand spliced because this operation has always presented a difficult problem. Now you can get a special NRM Weldstitch splicer for small diameter tubes. The NRM splicer does the job efficiently and economically. Rejects are reduced to a minimum.



The Tube Splicer (shown above) derives its name, "Weldstitch" from the appearance of the butt-spliced joint. Special serrated jaws knit the tube ends together—making an impression similar to stitches. The Weldstitch process is licensed. A larger machine is available for passenger and truck tubes up to 21" flat width. *Write for detailed information.*

POLYETHYLENE SHEETING? YOU CAN EXTRUDE IT YOURSELF AND SAVE

Tire manufacturers are using more and more polyethylene film in place of other materials for protecting tacky surfaces such as camelback. It is also used to protect white sidewalls of tires and for many other purposes.



Elevation shows NRM 4½" All-Electric Extruder with T-type polyethylene die, cooling tank, nip rolls and take-up.

Where sizeable quantities are used, big savings can be made by purchasing polyethylene pellets and extruding the film. NRM provides complete polyethylene extrusion units including cooling tanks, wind-ups and embossing attachments.

NATIONAL RUBBER MACHINERY CO.

General Offices & Engineering Laboratories
Akron 8, Ohio

PLANTS at Akron and Columbiana, Ohio and Clifton, N. J.
AGENTS East: National Rubber Machinery Co., Clifton, N. J.
West: S. M. Kipp, Box 441, Pasadena 18, Calif.
EXPORT Rubber Machinery: GILLESPIE & COMPANY
96 Wall Street, New York 5, N. Y.

Creative Engineering

Indonex Plasticizers

REG. U. S. PAT. OFF.

are recommended in the following rubber products – 84% of those in a modern automobile

Battery cases
Battery drain tube
Hood bumpers
Steering post pad
Radiator to hood seals
Water pump seal
Radiator hose
Fender & radiator shields
Lens gaskets
Parking light lens gaskets
Spark plug covers
Ignition wiring
Engine seals & gaskets
Engine front mount
Fan belt
Radiator drain tube
Sway eliminator bushings & cushions

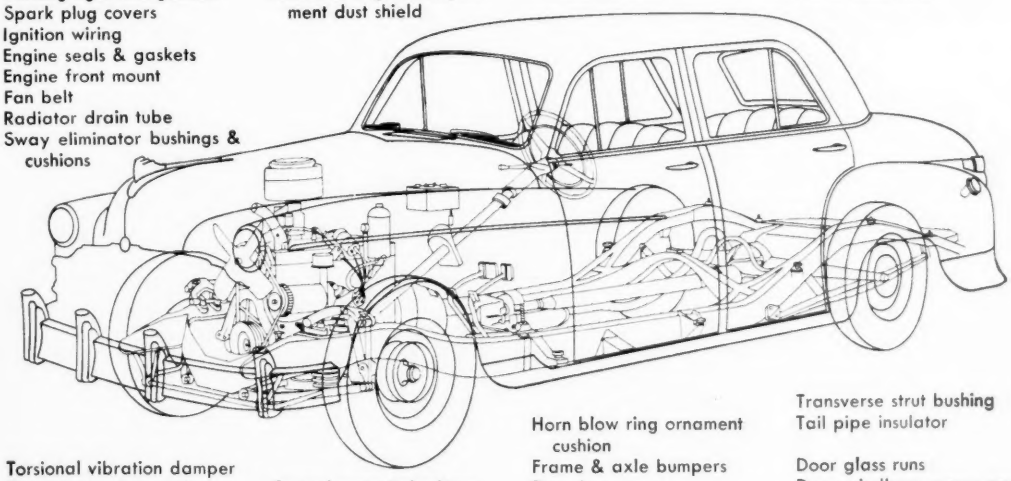
Steering post bracket insulator
Spring silencers
Control arm bumpers

Defroster and wiper hose
Windshield weatherstrip
Windshield wiper pivot pad
Cowl vent weatherstrip
Fender & engine compartment dust shield

Fender flaps
Master cylinder boot & cup
Accelerator-brake-clutch pedal pads
Brake & clutch pedal draft pads

Instrument panel anti squeaks
Steering wheel spoke ornament cushion

Division channel weatherstrip
Door inside locking knob
Hood & door lock seals
Rear deck mat
Tire & tube
Fender seals
Sill mats
Body insulators
Silent bloc bushing
Pinion shaft seal



Torsional vibration damper
Control arm dust seals

Fresh air adaptor grommet
Hood lacing
Glove box door bumpers
Heater hose
Steering collar insulator
Oil line hose
Shock absorber bushings
Steering gear arm insulator bushings

Control arm pin bushing seals
Steering knuckle dust seal
Hydraulic brake hose

Gear shift lever arm bushing
Oil gage hose
Antenna gaskets
Body shims
Transmission & engine rear mount

Horn blow ring ornament cushion
Frame & axle bumpers
Door bumpers
Door check arm bumpers
Dash liner & cowl trim pads
Door hinge post pillar bumper
Floor mats toe riser & trim
Propeller shaft boots

Steering wheel
Front door vent wing weatherstrip

Transverse strut bushing
Tail pipe insulator

Door glass runs
Door windlace spong cover
Rear vent window weatherstrips
Tail & stop lamp lens pads
Tail light mounting pads
Gas tank filler neck grommet
Bumper grommet
Stone deflector bumper
Gas tank shim
Bumper to fender spacer
Spring shackle bushing

Send for our "Automotive Products" Technical Circulars

INDOIL CHEMICAL COMPANY

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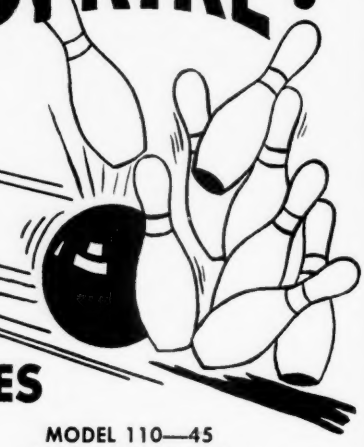
INDOIL® CHEMICAL PRODUCTS

ANOTHER STRIKE!



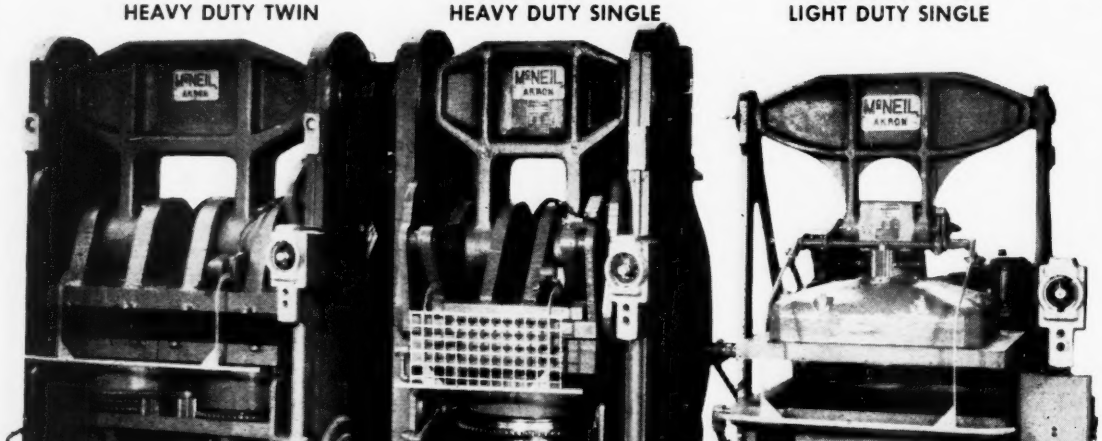
IN BOWLING,
WHEN A PLAYER MAKES
THREE CONSECUTIVE STRIKES, HE IS
SAID TO HAVE MADE A "TURKEY." WE AT
McNEIL HAVE ALSO MADE A "TURKEY" IN THESE THREE
MODELS OF OUR

MECHANICAL GOODS PRESSES

MODEL 800—24x24
HEAVY DUTY TWIN

MODEL 800—32
HEAVY DUTY SINGLE

MODEL 110—45
LIGHT DUTY SINGLE



MOTOR OPERATED — NO HYDRAULIC — SIMPLE SPEEDY ADJUSTMENT OF PLATENS

- 800,000 pounds total pressure
- Two 24" x 24" drilled platens Individually adjustable 1" minimum—6" maximum
- 700 pounds per square inch platen pressure
- Adjustments for mold loadings—zero to 200 tons each mold position
- Two 24" x 24" molds may be used in same or different thicknesses or one 24" x 48" mold

- 800,000 pounds total pressure
- 32" x 32" drilled steam platens
- 780 pounds per square inch platen pressure
- Adjustments of mold loadings—zero to 400 tons
- Range of mold thickness, 1" minimum to 5" maximum or 2" minimum to 6" maximum

- 110,000 pounds total pressure
- 40" x 40" drilled steel steam platens
- 70 pounds per square inch platen pressure
- Adjustment of mold loadings—zero to 55 tons
- Range of mold thickness, 4" minimum to 9" maximum

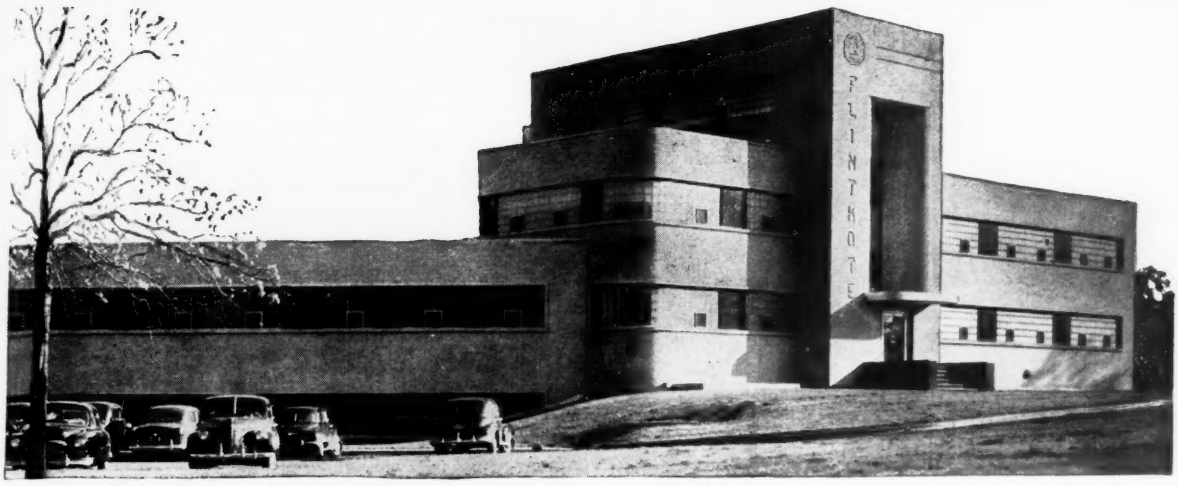
MANUFACTURING AGENTS

GREAT BRITAIN—Francis Shaw & Co. Ltd., Manchester, England
AUSTRALIA and NEW ZEALAND—Vickers Ruwolt Proprietary, Ltd., Victoria, Australia.

THE McNEIL MACHINE & ENGINEERING CO.

96 East Crosier St. Akron 11, Ohio

RUBBER WORKING MACHINERY • INDIVIDUAL CURING EQUIPMENT FOR TIRES, TUBES and MECHANICAL GOODS



House of New Ideas

FOR PRODUCTS AND SALES

Flintkote employs experienced technicians... Research Specialists who spend every working day tracking down new facts on materials and methods that can improve or broaden Flintkote's wide line of products for industry.

Housed in 24 separate, efficiently equipped laboratories... in one of the most modern buildings in the country... these technicians set the pace for Flintkote plants from coast to coast. This assures better products and better results consistent with lowest possible costs ... for you.

These researchers understand what makes business "tick," too. And they accept new product requirements as a recurring challenge. Also, the quality of our materials that have been in use for decades is carefully checked for today's applications.

So, if you are a user, or a potential user of Flintkote Industrial Products for construction, manufacturing or converting, remember that these trained specialists are at your service, to help find the solution to your problems. Full scale testing and pilot production methods are available under one roof. And, they'll follow through in your own plant if you wish.

Whether your requirements are coatings, adhesives, binders, floorings... asphalt, rubber or resin compounds... Automotive, Marine, Railroad, Construction, Building Maintenance products... see what we have now and can offer you for the future.

THE FLINTKOTE COMPANY

Industrial Products Division

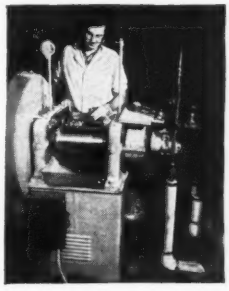
30 Rockefeller Plaza, New York 20, N. Y.

Atlanta • Boston • Chicago Heights • Detroit • Los Angeles
New Orleans • Washington • Toronto • Montreal

Testing effective coverage of asphalt coatings. The metal plate with coating is grounded and a charge is placed in the metal bristles of the brush. Even the smallest rupture in the film produces a visible spark, indicating incomplete protection.

Among Flintkote's many products is a line of asphaltic spray-on sound deadeners to quiet metal vibration noises. In a specially-built sound-proof room, an electronic device measures the ability of various coatings to meet rigid specifications.

Summer and Winter climate, rain and burning heat are produced in the Research Laboratory. This Twin-Arc Weather-Ometer provides accurate control of accelerated weathering tests. Products designed for exposure must survive for many years.



This small mill is used to break down various rubber materials to the right consistency for use in new products or processes. Full size operation follows in the production of versatile fluid rubber and rubber-like adhesives, coatings and the like.

FLINTKOTE INDUSTRIAL PRODUCTS

FLINTKOTE

Products for Industry

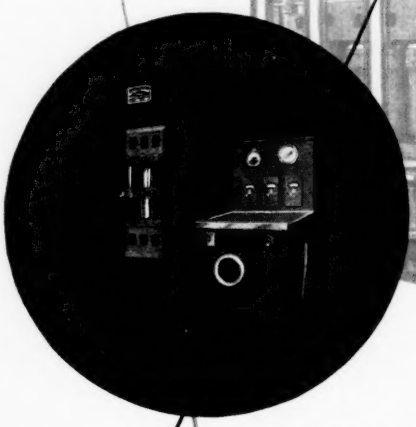
A New Year's Resolution readily kept and perpetuated:

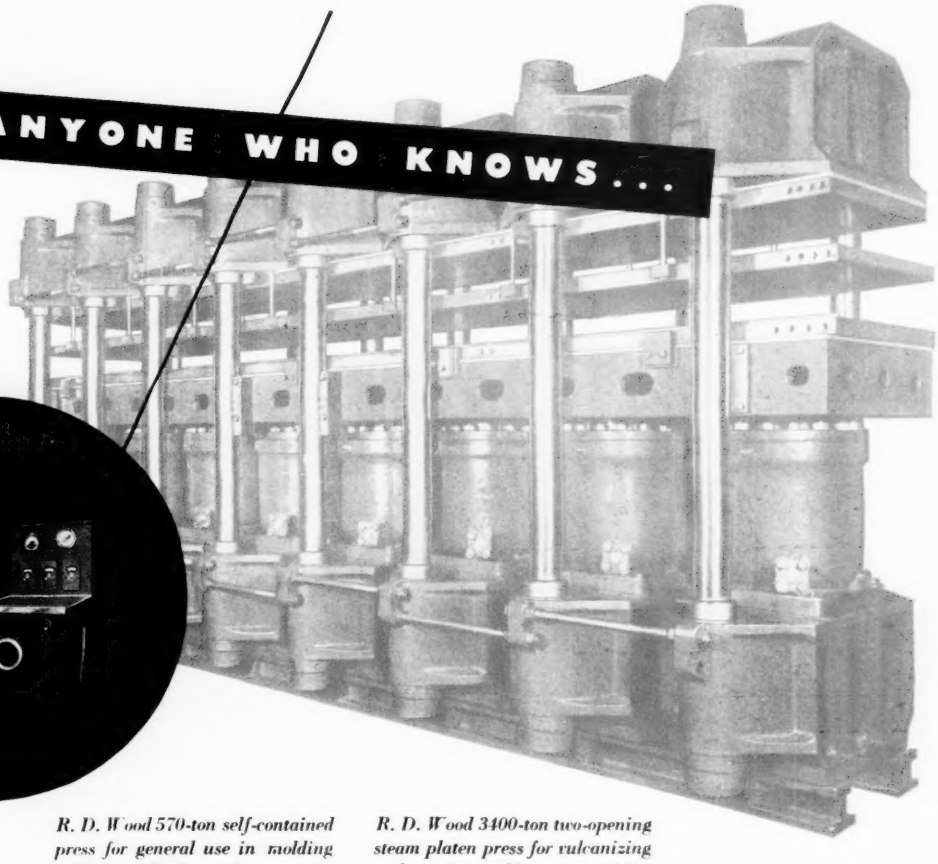
Year after year, many of the country's substantial consumers specify ST. JOE ZINC OXIDES as a matter of course. While behind the preference thus indicated may be a variety of individual and specific reasons, their sum and substance can be expressed in plain, elementary language as follows:

The *consistent* high quality of St. Joe zinc oxides makes their continued use in the rubber, paint, ceramic and other industries a matter of sound business procedure.

ST. JOSEPH LEAD COMPANY *250 PARK AVENUE, NEW YORK 17, ELDORADO 5-3200*
Plant & Laboratory, Monaca (Josephtown) Pennsylvania

ASK ANYONE WHO KNOWS...





R. D. Wood 570-ton self-contained press for general use in molding rubber or plastic products, or for laboratory service.

R. D. Wood 3400-ton two-opening steam platen press for vulcanizing and curing rubber composition sheet packing, floor tile, and rubber belting.

You get from an R. D. Wood hydraulic press *engineered performance*—year after year!

You get this proved performance because R. D. Wood hydraulic presses are very carefully designed and built—with only the finest materials used in their construction.

You get this performance—with all its obvious economies—because 150 years of manufacturing experience go into each piece of R. D. Wood equipment.

Whatever your hydraulic press needs or problems might be, get in touch with R. D. Wood engineers. Let them show you how *performance* makes a Wood press a good press.

HYDRAULIC PRESSES AND VALVES FOR EVERY PURPOSE • ACCUMULATORS • ALLEVIATORS • INTENSIFIERS

EST. 1803

R. D. Wood Company

PUBLIC LEDGER BUILDING PHILADELPHIA 5, PA.

RUBBER MATS

PARADENE
NEVOLL
R-16

MECHANICAL GOODS

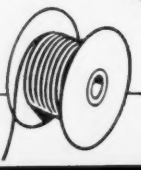
PARADENE
NEVOLL • R-GRADES
X-1 RESINOUS OILS

WHITE WALL TIRE STOCKS

R-13 • R-14 • R-15

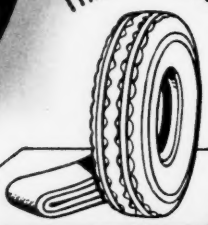
How NEVILLE can serve the Rubber Industry

WIRE INSULATION



PARADENE
R-16

TIRES & TUBES



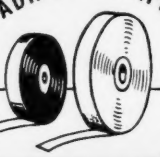
PARADENE
NEVOLL
R-16

MOLDED PRODUCTS

NEVOLL
R-6 • R-17 • R-29

Why not call on Neville's years of research and experience for help on your rubber production problems?

ADHESIVE TAPE



PARADENE
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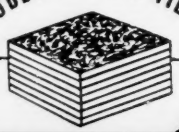

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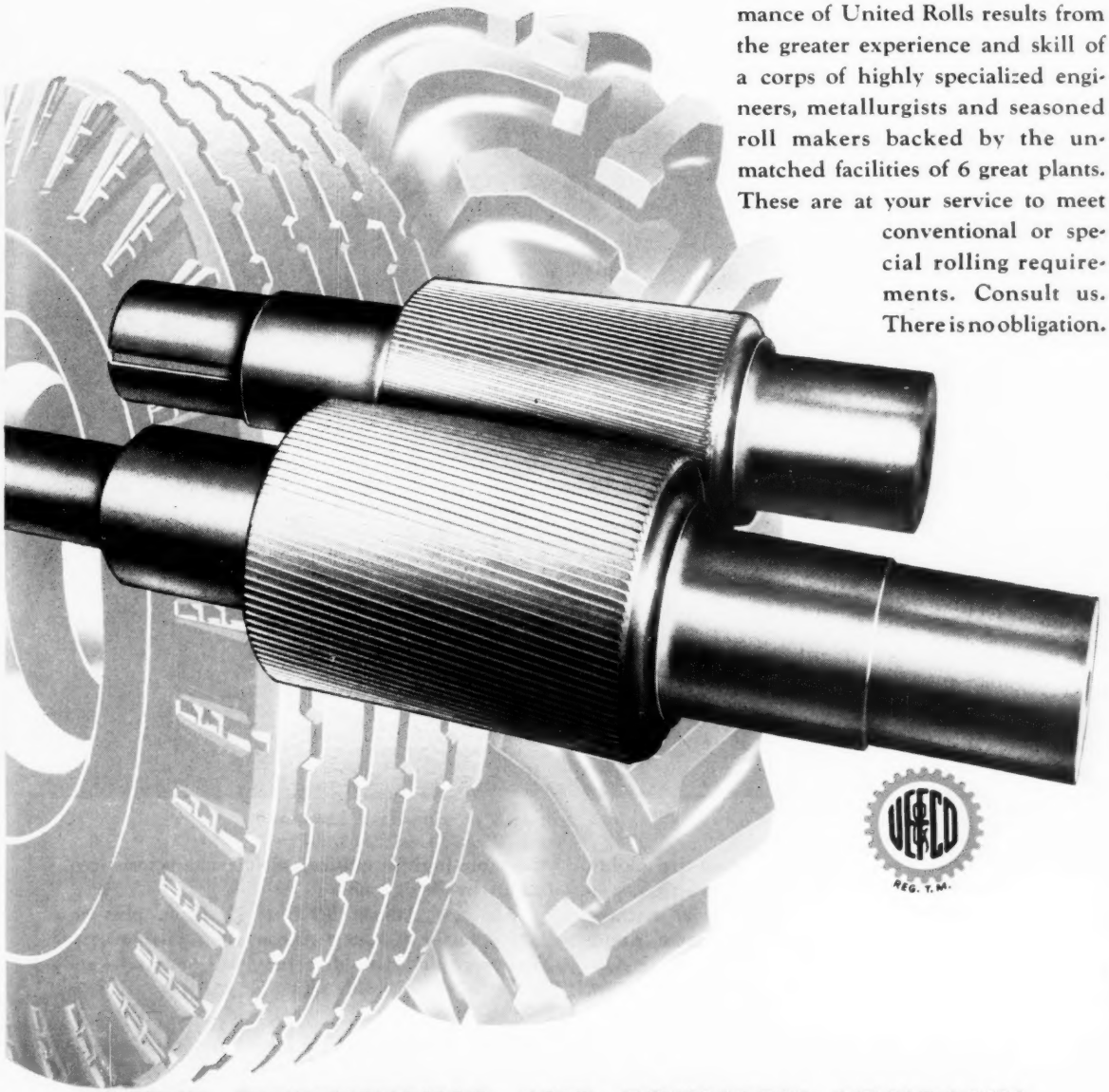

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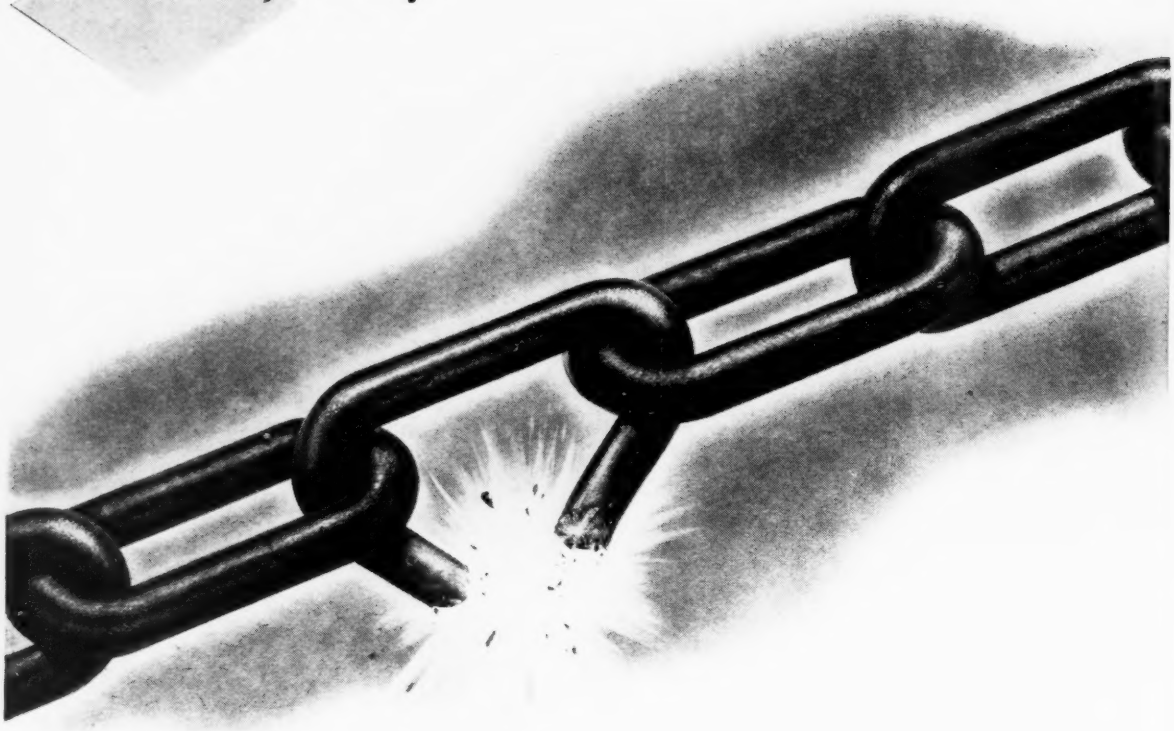

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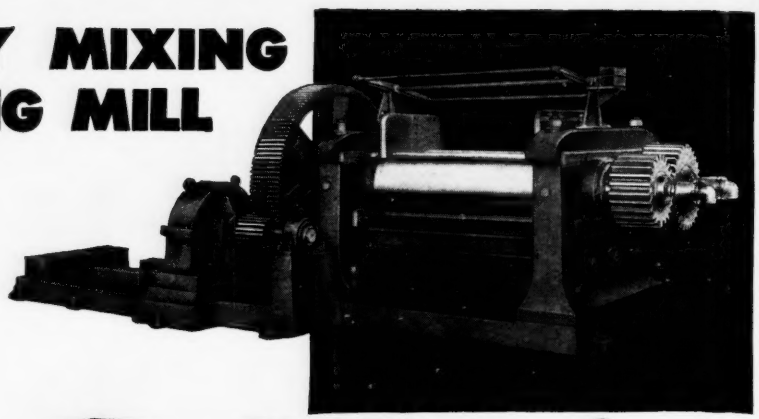

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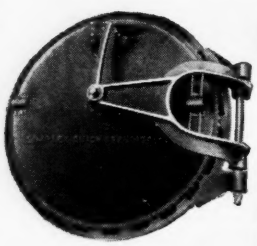

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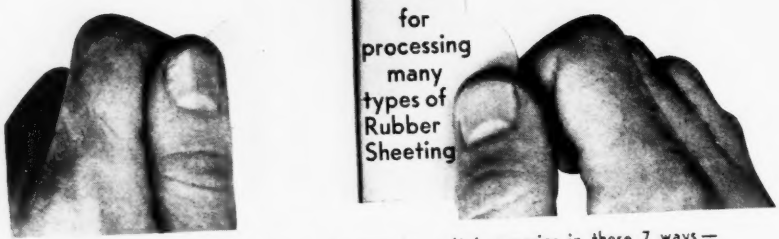

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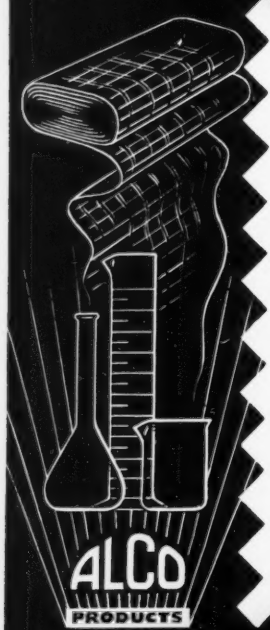

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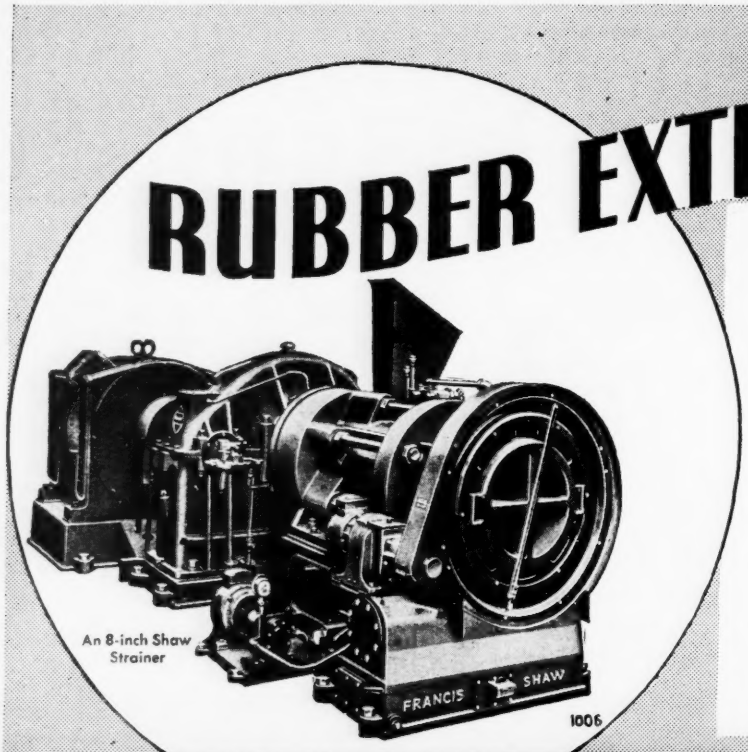

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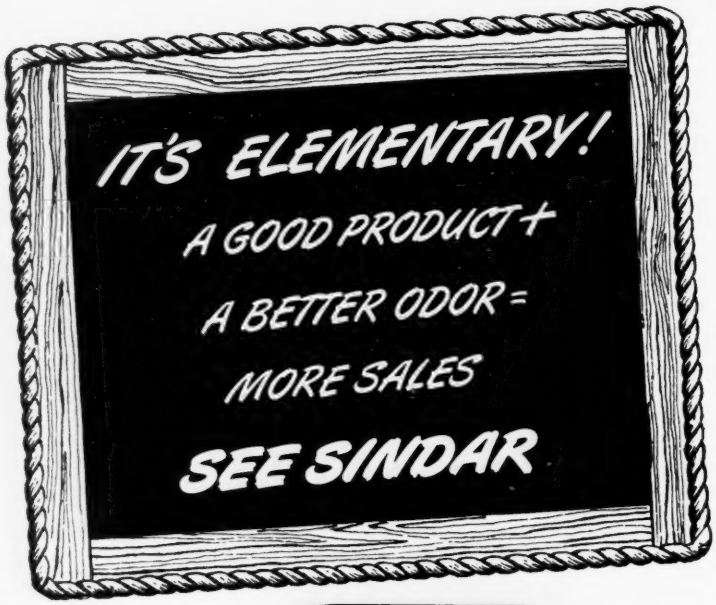

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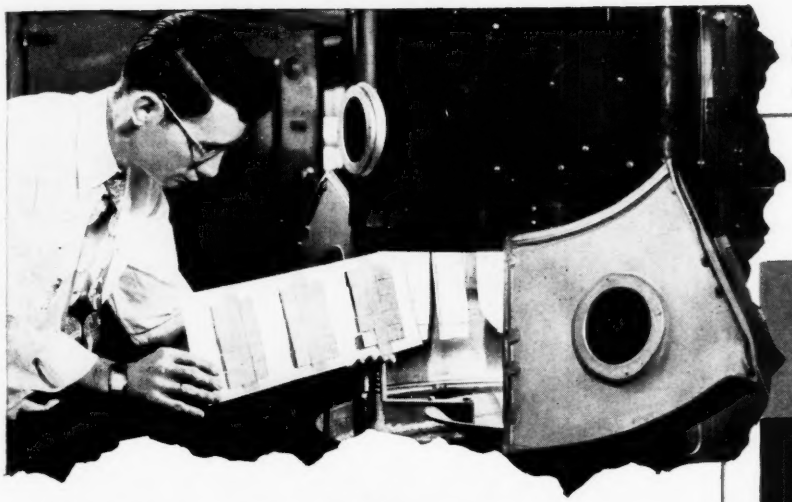
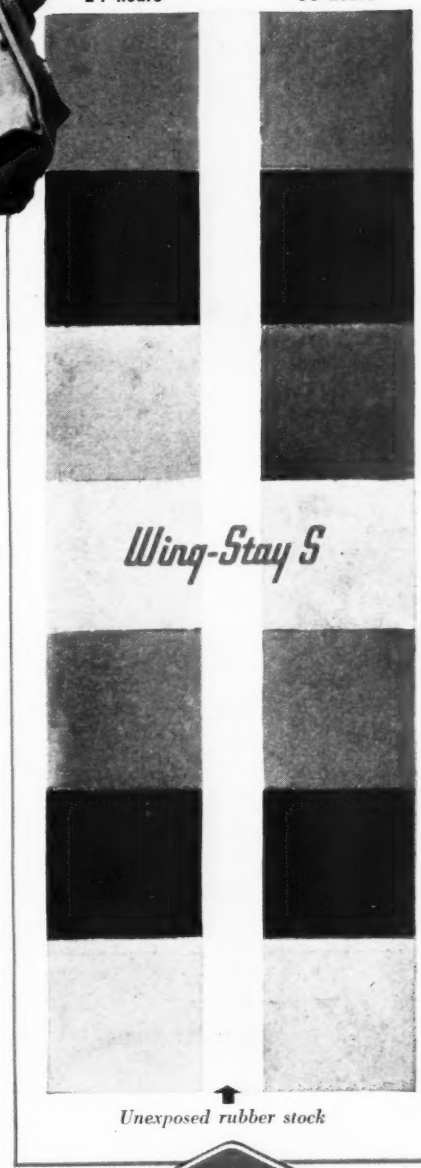


Fade-O-Meter test-checks discoloring of various anti-oxidants. Panel, below, shows superiority of Wing-Stay S compared with six leading anti-oxidants. Center strip is unexposed white control stock.



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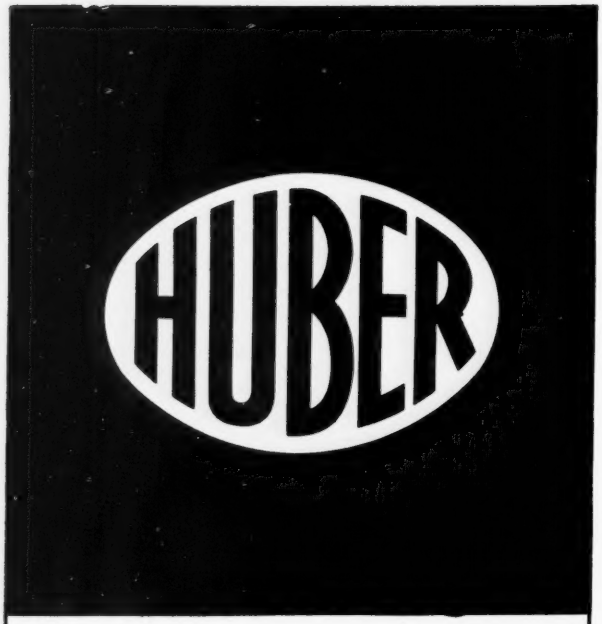

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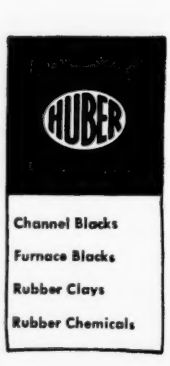

February, 1950

Volume 121 Number 5

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RUBBER WORLD

Volume 121 | New York, February, 1950 | Number 5

Stress Relaxation of Some Rubber and Synthetic Rubber Vulcanizates In Compression[1]

J. R. Beatty[2] and A. E. Juve[2]

VULCANIZATES of rubber and synthetic rubber find wide and useful applications under conditions of compressive stress in gaskets, seals, suspension systems for vibration isolation, and other uses. In some of these applications the rubber is subjected to a load, either static or dynamic, or a combination of both. In other cases the compression strain is constant, and the stress resulting therefrom is utilized as a seal for fluids or gases. It is with this second application of rubber in compression that this work is concerned.

In the use of rubber under compression as a seal the service life is dependent on maintaining a value of stress above a minimum necessary for the seal to be effective. It can readily be seen, then, that some method of evaluating materials with respect to service life is highly desirable. Compression set tests, ASTM D-395-47T, method A or B, depending on the service conditions, have been widely used for some time in evaluating rubber materials to be used in compression. This test, however, does not give an answer which is directly applicable as to units, and the test time usually used is too short. Test results are reported as percentages secured from the ratio of the non-recovered portion of the amount compressed to the amount the sample is compressed. The non-recovered portion of the amount the sample is compressed is measured after a prescribed interval at room temperature after removing the stress from the sample. A better measure of the property in question, the stress as a function of time, would be to measure this property directly.

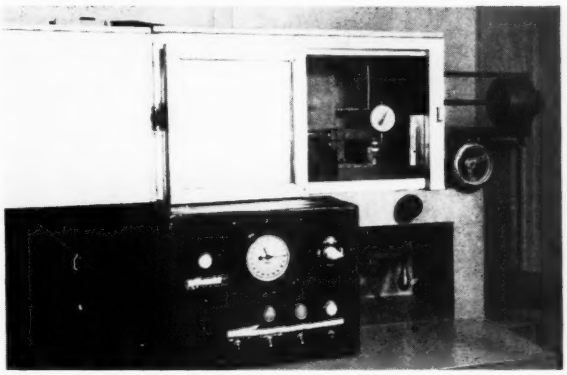


Fig. 1. Equipment Used for Stress Relaxation Tests

Many excellent articles have been written on compression stress measurements of rubber,[3] stress relaxation of tension samples,[4] compression stress relaxation as affected by low temperature,[5] and compression stress relaxation measuring devices.[6, 7, 8] These papers have been useful and informative in their fields, but did not apply to the problem at hand either owing to the fact that the sample or conditions did not approximate those encountered in this particular field of application, or the breadth of the investigation was inadequate. More information was desired on the various commercially available polymers and the effect on the compression stress relaxation of these compounded polymers of a wide temperature range, various degress of deformation, and some variations in composition. In addition, before these variables were investigated, it was necessary to determine the effect of sample shape and slippage on stress relaxation. The latter two factors would influence the choice of sample or sample construction. The effect of shape of sample and lubricated compressing surfaces has already been determined on the load-deflection characteristics.[3]

Testing Equipment

A simple tester to provide the information desired was designed and built similar to that of Blow and Fletcher.[8]

[1] Presented before Rubber & Plastics Division, A.S.M.E., New York, N. Y., Nov. 29, 1949.
[2] B. F. Goodrich Co. Research Center, Brecksville, O.
[3] E. G. Kimmich, India RUBBER WORLD, 103, 3, 45 (1940).
[4] A. V. Tobolsky, J. B. Prettyman, J. H. Dillon, *J. Applied Phys.*, 15, 380, (1944).
[5] W. E. Phillips, B. G. Labbe, India RUBBER WORLD, 119, 224 (1948).
[6] R. E. Morris, R. R. Jones, I. P. Seegman, *Ibid.*, 119, 4, 466 (1949).
[7] W. S. McDonald, Alex P. Ushakoff, *Anal. Chem.*, 20, 8, 713 (1948).
[8] C. M. Blow, W. P. Fletcher, *India Rubber J.*, 106, 403 (1944).

Figure 1 is a photograph of the complete apparatus, and Figure 2 is a diagram of the essential parts and their operation. The tester is essentially a method of compressing a sample a predetermined percentage of its original height and measuring, by an adjustable dead weight loading, the minimum stress necessary to maintain this deflection as a function of time. As this property of rubber and rubber-like materials is temperature dependent, the machine was enclosed in a temperature controlled air oven. The maximum load which it is possible to apply to the test specimen is 1,000 pounds. To increase the number of tests which could be run simultaneously jigs such as shown in Figure 3 were made. These jigs made it possible to remove the sample and jig from the tester, while the desired compression was maintained on the sample, and to place the assembly in an oven at whatever temperature desired. Other tests could also be made, and the stress checked periodically by placing the jig and sample into the tester and determining the stress to maintain the original deflection. These jigs were used exclusively for long-time tests.

The test sample used in the major portion of this work was the ASTM compression set sample, 0.500-inch in height and 1.129 inches in diameter, giving an area of one square inch. These samples were die cut from six- by ten-inch sheets of the compounded cured rubber.

Recipes, cures, and stress-strain properties of the compounds used in this work are given in Table 1. The cures were selected on the basis of stress-strain tests.

TABLE 1. RECIPES, CURES, AND TENSILE PROPERTIES OF COMPOUNDS TESTED

Cpd. #1		Cpd. #2		Cpd. #3	
Nat. rubber	100	Nat. rubber	100	GR-S 10	100
Zinc oxide	5	Zinc oxide	5	Zinc oxide	5
M.B T.S*	1	S.R.F. Black	80	M.B.T.S*	1.75
S.R.F. Black	75	AgeRite Powd.	1	S.R.F. Black	65
Stearic acid	1	T.M.T.D†	3.5	Sulfur	1.75
AgeRite Powd.	1		189.5		173.5
Sulfur	2.5				
	185.5				
Cured 35 min. at 140° C.		Cured 35 min. at 140° C.		Cured 90 min. at 150° C.	

Cpd. #4		Cpd. #5		Cpd. #6	
Neoprene GN	100	Hycar OR-15	100	Hycar OR-15	100
S.R.F. Black	45	Zinc oxide	5	Zinc oxide	5
Zinc oxide	5	M.B.T.S*	1	S.R.F. Black	50
Mag. oxide	4	S.R.F. Black	45	T.M.T.D.†	4
	154	Sulfur	1.5		159
			152.5		
Cured 40 min. at 150° C.		Cured 40 min. at 150° C		Cured 40 min. at 150° C.	

Cpd. #7	
GR-I	100
Zinc oxide	5
M.B.T.S.*	0.5
S.R.F. Black	60
Sulfur	2
T.M.T.D.†	1
	168.5
Cured 40 min. at 150° C	

*2-2, Benzothiazole disulfide.
†Tetramethyl thiuram disulfide.

Physical Properties				
Cpd.	Shore "A" Durometer	Tensile Strength (p.s.i.)	Elongation (%)	300% Modulus (p.s.i.)
#1	64	2700	430	2150
2	61	2800	425	1650
3	64	2400	460	1600
4	66	2700	420	2300
5	65	2600	380	2100
6	63	2600	520	1700
7	58	1800	725	600

Test Procedure

Two samples are conditioned at the same time until equilibrium temperature is attained, and the free heights of the samples are measured. The sample pedestal is adjusted to give the correct compression, and the first sample is loaded in increments until the predetermined compression is secured. This operation required about 30 to 40 seconds. This sample is discarded, and the sample pedestal is reset if necessary. The stress found necessary to produce the desired deflection is then imposed on the second sample; time is measured in seconds from the moment compression starts. Thirty-six seconds, or 0.01-hour, is usually the shortest time in which it is possible to determine accurately the compression stress; so it is usually spoken of as the "zero" time. Successive readings are in approximately a geometric progression from 0.01-hour as the curve of stress relaxation is approximately a straight line when plotted against logarithmic time.

At the start of this program it was arbitrarily decided that when the value of S_t/S_o, or the stress at time t, reached 50% of the initial stress (at 0.01-hour), the test would be considered complete. This is probably much too soon if measurements of actual service life are to be made, as less than 50% of the initial stress would, in many instances, perform the job required. However many of these tests would have continued for such long times that the value of such data is doubtful, and it is thought that estimates of service life based on the 50% value are reasonably valid.

Accuracy

The stress on the sample may be determined to ± ½-pound, and, as it is rare for the stress to go below 100 pounds, the maximum error in the determinations is in the order of 1%. In most determinations the possible error is never more than half this as the stress is 200 pounds or more at the end of the test, i.e., when the stress value of 50% of the initial stress is attained.

Results

Effect of Sample Shape and Size

The effect of sample shape and size on compression stress relaxation for five geometries of samples is shown in Figure 4. These samples consisted of a cylinder 1.129-inch in diameter by 0.5-inch high (ASTM compression set button), a cylinder 0.7-inch in diameter by 0.5-inch high, a hollow cylinder 1.129-inch O.D. and 0.7-inch I.D. by 0.5-inch high, a rectangular piece one- by one- by 0.5-inch high, and a 0.5-inch cube.

Effect of Slippage

Figure 5 shows some typical data obtained with 1.129-inch diameter by 0.5-inch high samples bonded to steel, against polished steel with no bond, and smooth polished steel with lubricants. The agreement for any one compound is good regardless of surface friction. A medium-viscosity silicone oil and castor oil were used as the lubricants.

Effect of Degree of Deformation

Stress relaxation has been reported to be independent of the degree of deformation.[4, 7] This point was checked in the course of the investigation reported here, and the results are shown in Figure 6.

Effect of Polymer

Stocks of natural rubber, GR-S 10, Neoprene GN, Hycar OR-15 and GR-I were prepared according to the recipes of Table 1. They were compounded to have a hardness range of 60±5 points Shore "A" durometer hardness. Figure 7 shows the effect of polymer with some typical stocks of these polymers at a test temperature of 70° C. In Figure 8 are shown some effects of the use of a different type of cure on natural rubber and Hycar OR-15.

Effect of Temperature

Figures 9-15 inclusive present data for seven compounds over a temperature range of from +24 to 150° C. for all compounds and a few tests run at —25° C.

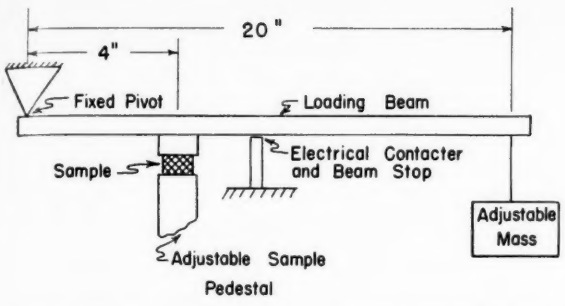


Fig. 2. Schematic Diagram of Stress Relaxation Testing Equipment

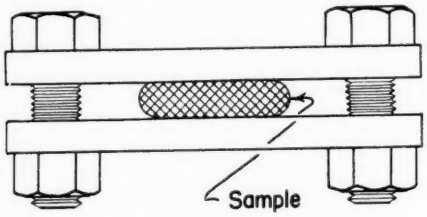


Fig. 3. Stress Relaxation Testing Jig

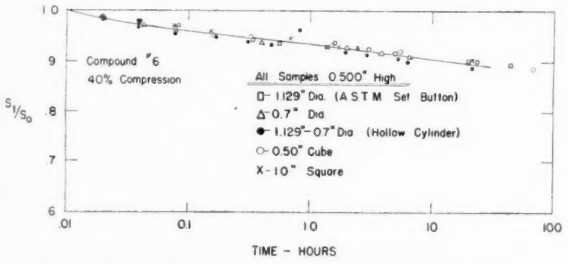


Fig. 4. Effect of Sample Shape on Stress Relaxation Results

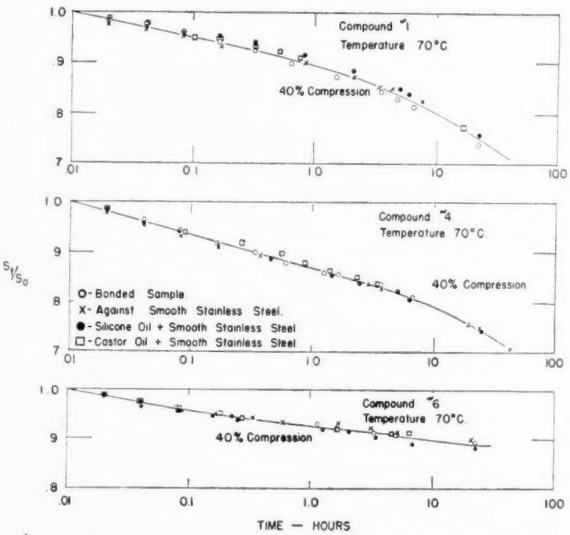


Fig. 5. Effect of Type-Test Surface on Stress Relaxation Results

Discussion of Results

Several factors are involved in compression testing of rubber. In the usual test the rubber sample, usually a cylinder, is compressed between metal plates which may be smooth machine finish, smooth machine finish with a high polish, or have grooves, serrations, or other surface roughness to minimize slippage. In this work it seemed desirable to determine experimentally whether the sample geometry had any effect on compression stress relaxation. The curve drawn in Figure 4 is the best fit for the data obtained. The maximum deviation from this curve is about $\pm 1\%$, or approximately the experimental error; so it is concluded that stress relaxation is independent of sample shape or size within reasonable limits. It was found, however, that the initial

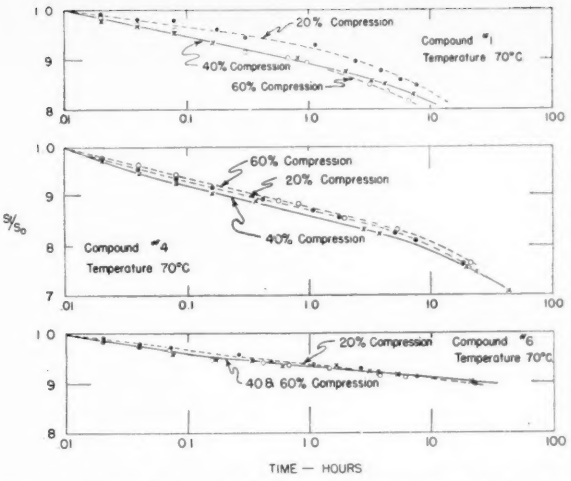


Fig. 6. Effect of Degree of Deformation of Sample on Test Results

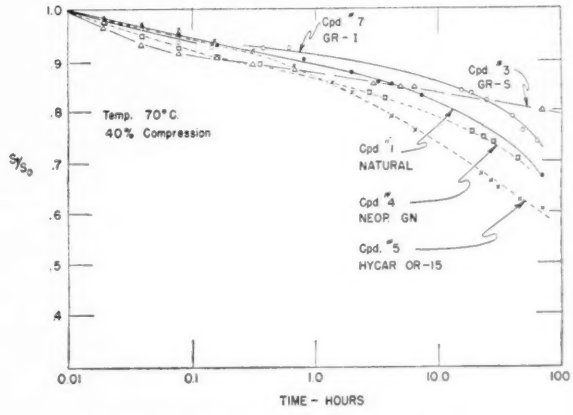


Fig. 7. Effect of Type-Polymer on Test Results

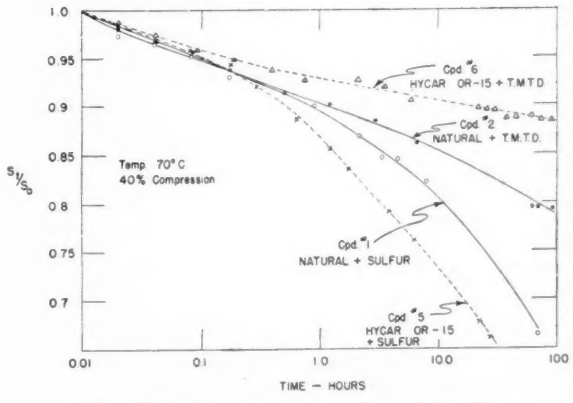


Fig. 8. Effect of Type of Cure on Stress Relaxation

stress varied greatly with change in geometry of the test piece, which point is in agreement with the work of another investigation.[3]

The effect of slippage with roughened compressing surfaces and lubrication has been thoroughly investigated by Kimmich[3] with respect to compression loading. He found that the stress required for a given compression was a function of the slipping of the sample on the surfaces between which it was compressed. Lubricated surfaces, which most nearly approach compression stress only, in that the sides of the sample do not bulge, give lower values of stress for comparable deformation, as would be expected.

The effect of sample slippage on the relaxation of stress with time is not well known however, although some authors attribute the non-linearity of the stress *vs.* log. time plot to sample slippage, and one author[9] found a large effect of compression plate surface on stress relaxation or stress decay which in his experiments included creep due to the type of test equipment. No significant trend in the data resulting from slippage is observed in Figure 5. Bonded, unbonded, and lubricated samples were tested.

Degree of Deformation

Tests made in the laboratory, results of which are shown in Figure 6, show no effect of degree of deformation. A maximum deviation from the mean of about $\pm 2\%$ was found in one case, that of compound #1. The other results shown in this figure have less deviation from the mean, about $\pm 1\%$, which error might easily result from experimental error and differences between samples.

Effect of Polymer

In Figure 7 it is seen that the materials arrange themselves in various orders of superiority, depending on the time at which the curves are observed. The GR-S stock, Compound #3, is the only stock giving essentially a straight line for values on this plot. The differences between compounds observed early in the test period are influenced largely by the elasticity of the rubber, while the departure of the curves from a straight line seems to indicate the effect of oxidation on the rubber. In Figure 8 it is shown that by the use of a particular non-sulfur cure it is possible to improve the compression stress relaxation of both Hycar OR-15 and natural rubber.

Effect of Temperature

Several effects are superimposed in the data secured as a function of temperature.[10] The one having the most effect on the results in this investigation is the "highly elastic" component of reversible deformation in rubber-like materials associated with the Brownian or heat motion. During deformation the "highly elastic" component of deformation is associated with a rearrangement of the structural elements and lags behind the change in external force by an amount dependent on the mobility of heat motion of the elements. The heat motion in rubber is critically dependent on temperature; at low temperatures it is small, and rearrangement of the particles proceeds slowly; so "high elasticity" is suppressed.

The relaxation or orientation time of a material is the time taken for rearrangement of the elements, which rearrangement is a function of the heat motion. This time is defined by the balance of cohesive and repulsive forces in the material and becomes larger with low temperatures and shorter with high temperatures.

If the applied stress is measured at a time which is short compared to the relaxation or orientation time, there may be insufficient time for rearrangement to occur, and "highly elastic" deformation will not be established until a much later time. This point is illustrated in the data taken at —25° C. Data taken at temperatures above room temperature show shorter orientation or relaxation times when compared with the stress measurement at 0.01-hour as shown by the fact that the "highly elastic" deformation has occurred to a large extent before the stress measurement was taken. However, another factor which influences the early results at the lower temperatures in loaded stocks is the filler effect reported by Mullins.[11] It is thought that this factor as well as the time and temperature dependent "highly elastic" deformation takes place quite early in the test period, and the measurements at this time are the combined effect of the two. On this basis two alternatives are available for analyzing the data. The slope of the curve at the desired time would be a true indication of performance, or a pure gum vulcanizate could be tested in which the filler effect is avoided. The former method is the more practical.

Data at intermediate temperatures in this investigation which show a change in slope early in the test which cannot be ascribed to sample slippage or oxidation probably indicate the orientation or relaxation time of the rubber and filler is slightly longer than the time at which the initial stress (S_o) is measured.

The relative resistance to oxidation according to some authors[4] accounts for differences in stress relaxation at the higher temperatures and after times which are long when compared to the orientation or relaxation time.

In Figure 9 it is seen that the early portions of the curves at 45, 70, and 100° C. for Compound #1, a natural rubber sulfur-cured stock, are above the room temperature curve owing to the "highly elastic" component of reversible deformation in rubber. At a test temperature of 150° C. oxidation effects are marked from inception of the test. The relatively high values of S_t/S_o compared to the other materials tested at —25° C. for this compound are due to its short orientation time and small modulus change due to low temperature.

Compound #2, a natural rubber stock cured with tetra methyl thiuram disulfide, exhibits superior properties to a sulfur cure at high temperatures. This type of cure minimized the effect of oxidation. The poor performance at —25° C. in this case is thought to be due to a long orientation time, and in addition there may be some crystallization effects.

The results for the GR-S stock, Compound #3, (Figure 11) show somewhat the same general temperature dependence as the previous curve. Oxidation effects are not so marked, however, and the data obtained at —25° C. are due entirely to the long orientation time.

The oxidation effects on Compound #4 shown in Figure 12 are not great. The material is subject to stress-relaxation; the rate is dependent on the test temperature. At —25° C. the curve shows a decided change in slope after 10 hours, which is attributed to crystallization.

[9] F. C. Thorn, *ASTM Bulletin*, 112, 13 (1941).
[10] A. P. Alexandrov, J. S. Lazurkin, *Acta Physiochim., U.R.S.S.*, 12, 648 (1940).
"Rubber in Engineering," p. 10, Chemical Publishing Co., Inc., Brooklyn (1946).
[11] *J. Rubber Res.*, 16, 12 (1947); India Rubber World, 120, 1, 63 (1949).

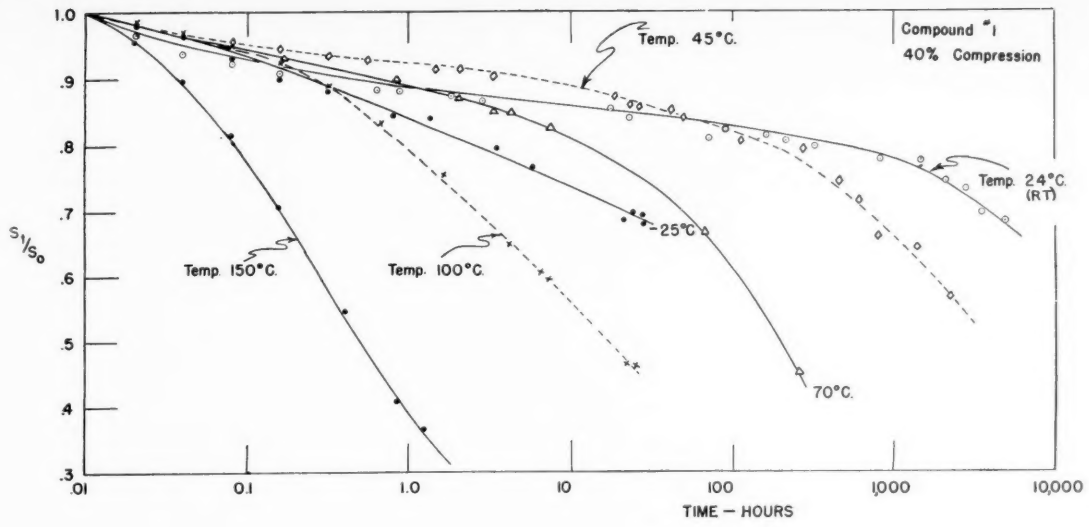


Fig. 9. Effect of Temperature on Stress Relaxation—Natural Rubber-Sulfur Compound

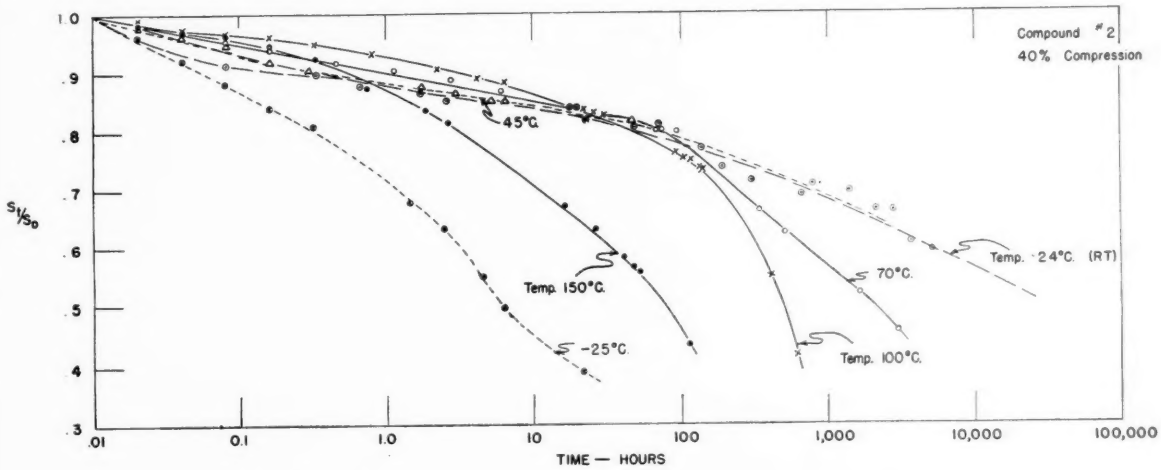


Fig. 10. Effect of Temperature on Stress Relaxation—Natural Rubber-T.M.T.D. Compound

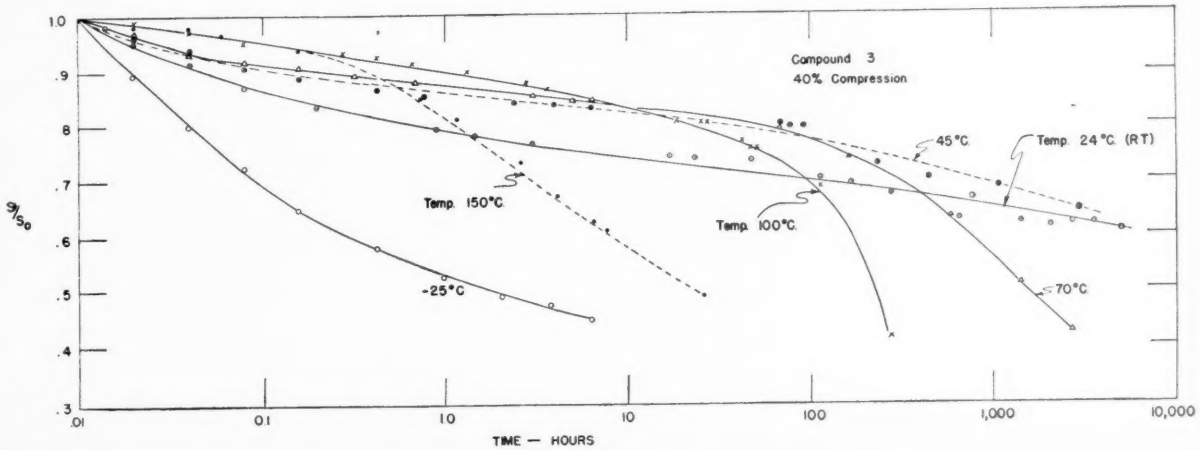


Fig. 11. Effect of Temperature on Stress Relaxation—GR-S-10-Sulfur Compound

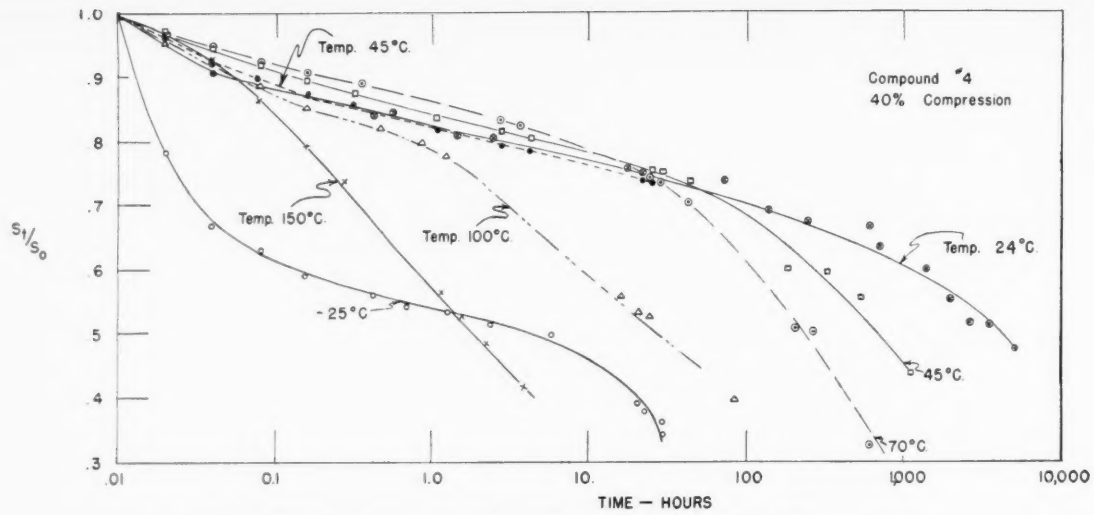


Fig. 12. Effect of Temperature on Stress Relaxation—Neoprene GN Compound

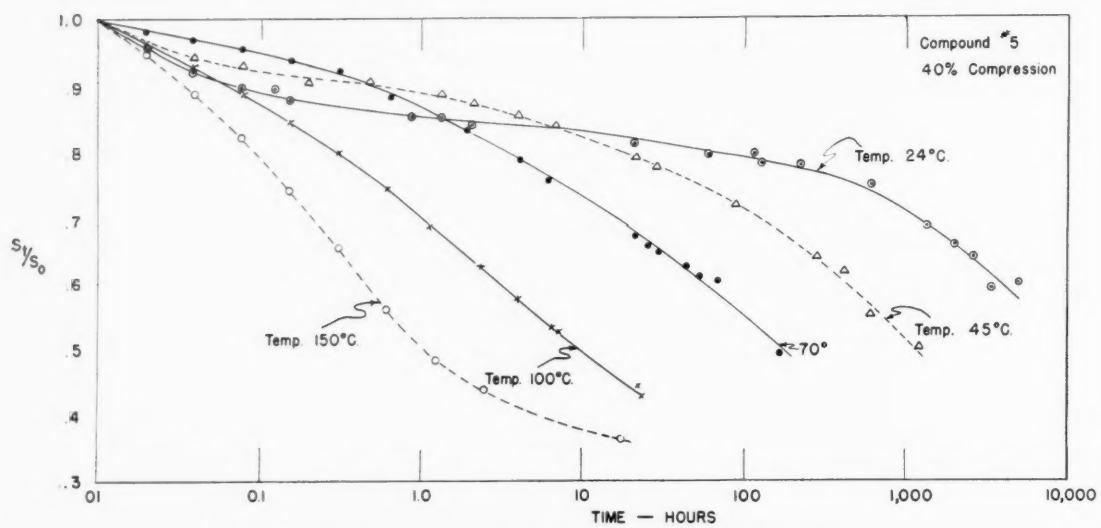


Fig. 13. Effect of Temperature on Stress Relaxation—Hycar OR-15-Sulfur Compound

Compound #5, the Hycar OR-15 sulfur cure, shows a marked dependence of stress relaxation upon temperature (Figure 13). With this same polymer the temperature effect seems to be minimized by a tetramethyl thiuram disulfide cure as shown in Figure 14 (Compound #6). With Compound #6 in particular it will be noted that the increased rate of oxidation usually found due to raising the test temperature is resisted successfully in the case of the 45 and 70° C. tests for a considerable length of time.

Figure 15 shows the stress relxation of GR-I, Compound #7, as being very temperature dependent. The stress relaxation at room temperature is low, but increasing or decreasing the temperature increases the rate of stress relaxation considerably.

Table 2 summarizes the data on the effect of temperature on the stress relaxation of the seven compounds tested. From this table it is readily seen that a compound which gives good results at room temperature does not necessarily retain this property at high temperature or low temperature when compared to another rubber compound. For example Compound #1 and #2 or #2 and #7 show this markedly.

TABLE 2. SUMMARY OF STRESS RELAXATION DATA

Compound	Time in hours S_t/S_o to reach .7 at temperatures of: 25° C.	24° C.	45° C.	70° C.	100° C.	150° C.
#1	21	4000	700	50	2.7	0.16
#2	1.2	700	700	220	185	13.
#3	0.1	100	700	300	100	3.0
#4	.67	83	83	45	3.1	0.3
#5	..	1,200	130	16	1.0	0.25
#6	..	*50,000	*15,000	2,100	130	27.02
#7	0.02	3,500	400	80	5.2	165

*These figures are extrapolated.

TABLE 3. CORRELATION BETWEEN COMPRESSION STRESS RELAXATION AND COMPRESSION SET AT 40% COMPRESSION

Compound #	Compression Set at 22 Hours at 70° C. %	Rank	Compression Stress Relaxation at 22 Hours at 70° C. %	Rank	Compression Stress Relaxation at 70° C. after 100 Hours %	Rank
1	35	6	24	4	38	5
2	13	2	17	2	21	2
3	14	3	18	3	22	3
4	34	5	26	5	38	5
5	34	5	33	6	45	6
6	9	1	15	1	12	1
7	15	4	18	3	34	4

Experimental results herein reported do not agree in all respects with those reported by Tobolsky *et al.*[4] who

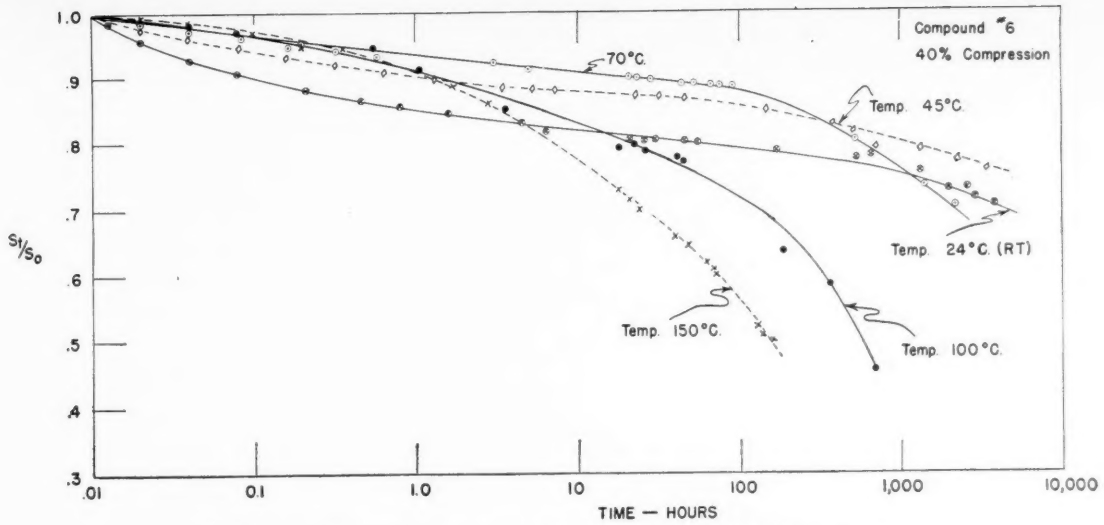


Fig. 14. Effect of Temperature on Stress Relaxation—Hycar OR-15-T.M.T.D. Compound

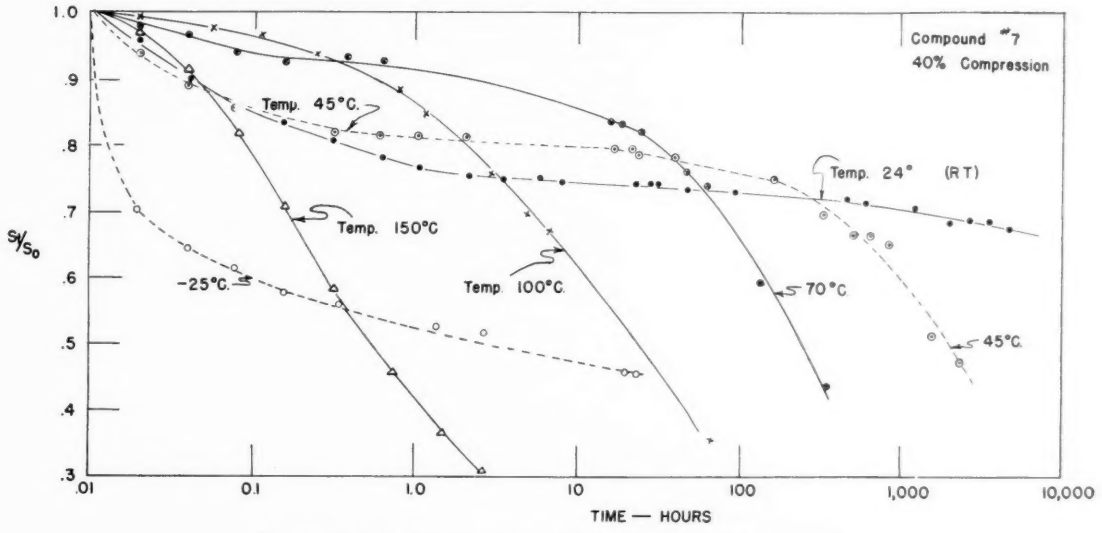


Fig. 15. Effect of Temperature on Stress Relaxation—GR-I Compound

utilized ring specimens of small cross-section in tension. The lack of agreement is undoubtedly due to the relatively large volume/surface area ratio of the samples used in this investigation which prevents the attainment of equilibrium conditions.

Correlation between Compression Set and Compression Stress Relaxation

There was the possibility that compression set tests conducted by ASTM D-395-47T, method B, might correlate with compression stress relaxation results as the property is at least partially involved in both tests. Table 3 compares results from the two types of tests on the same rubber compounds with identical conditions of temperature and deformation. The values for stress relaxation are actually $(1\text{-}S_t/S_o)$, or the % stress lost rather than the % stress retained ordinarily used. This makes the numbers correspond more closely, as set tests measure the % of height lost over the test period. The correlation is just fair, but considering variables of the compression set tests that is to be expected. The same general trend in rating the compounds is noted, however, in both test methods.

Report on Rubber Industry in Korea

The main products of the South Korean rubber industry are truck tires, rubber footwear, and rice rollers. Available statistics indicate considerable progress in the manufacture of tires in recent years, with average monthly outputs well above the prewar average. Output of truck tires in 1948 came to 9,931 units; for the first half of 1949 it was 8,886 units; 1948 production of bicycle tires totaled 110,899 pairs, against 75,553 pairs in the first half of 1949.

Production of footwear slumped in the early months of 1949, as compared with the previous year, and the total for the first half of 1949, despite a spurt to 2,687,556 pairs in the month of June, was only 9,504,672 pairs, against 22,688,492 pairs for all of 1948. However outputs of 2,196,056 and 3,315,856 pairs, in July and August, respectively, suggest that the final figure for 1949 may not be lower than for 1948.

Production of rice rollers was 51,538 pairs in 1948 and about 20,000 pairs in the first half of 1949.

Molding and Casting Processes Using Rubber Latex[1]

S. C. Stokes[2]

MANY references can be found in the literature to the production of hollow rubber articles by casting latex into hollow molds. The methods described are varied, but mainly concern (1) the use of porous molds, and (2) the use of metal molds in conjunction with heat-sensitized latex. The idea of using a porous surface for the deposition of rubber is by no means new, for as long ago as 1864,[3] Hancock suggested the production of figured rubber by casting latex on to a plaster of paris design and peeling the rubber off when dry.

The hollow articles are produced by filling the mold with latex and allowing a deposit of rubber to form on the walls of the mold, either by absorption of moisture in the case of plaster molds, or by coagulation of heat-sensitized latex with metal molds (heated to a temperature that will promote gelation). An alternative method is to rotate the mold containing sufficient latex to form the necessary deposit.

British patent No. 361,941 (1930) describes the production of molded articles of composition resembling wood. This comprises preparing a latex containing vulcanizing ingredients and a coarse filler such as wood flour, and preferably flocculated to a thixotropic mass. The mixture is poured into a mold, and after remaining in contact for a period necessary to produce the required thickness of deposit on the walls of the mold, the still mobile portion is poured out. The cavity can then be filled with sawdust, and the molding removed from the mold, and finally dried and vulcanized.

A plaster mold can be used for the above, and similar molds are suggested by Leseberg[4] for the production of rubber articles by a pouring process using a stabilized latex containing substances (e.g., gypsum) capable of chemically binding water. A similar process was suggested by Faber in 1935,[5] for the production of hollow rubber articles such as balls, water bottles, toys, and bathing caps. Both Leseberg and Faber suggest deposition on the inner surface of the mold, by not completely filling the mold, and then setting it into rotation so that the mass can distribute itself uniformly over the walls of the mold.

Heat Sensitivity

The year 1931 saw the first of the Kaysam[6] patents covering the manufacture of cast rubber articles from heat-sensitized latex. This process concerns the addition to latex of substances which cause instability of the latex at elevated temperatures. Sufficient latex containing vulcanizing ingredients and the gelation agent (e.g., ammonium nitrate) is poured into a hollow metal mold. The mold should be of the split type to facilitate removal of the molding. The mold containing the latex is revolved in order to deposit the latex on the inner surface and is heated sufficiently to cause gelation of the latex. Thus a lining of rubber is formed on the inside of the mold conforming to the design. The mold is opened and the molding is removed and then vulcanized, washed, and dried.

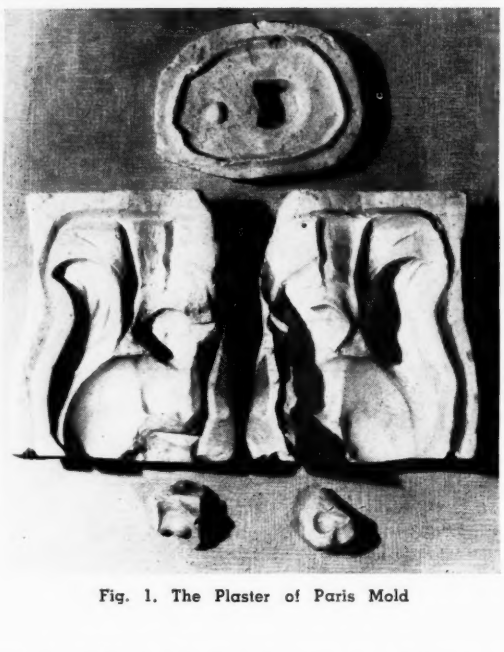


Fig. 1. The Plaster of Paris Mold

The Kaysam process, however, is not the first reference to heat-sensitized latex. In 1927 the Societa Italiana Pirelli covered the use of heat-sensitized latex[7], and gave us as an example the addition of calcium sulphate to latex (0.3% on the dry rubber) to produce a mixture capable of coagulation when heated, but stable at room temperature. More recently Chassaing and other French workers have claimed advantages for the production of heat-sensitized latex by the addition of zinc oxide to aged latex, or to latex which has been artificially aged by the addition of trypsin (powdered pig pancreas). As an example, latex to which 0.1% trypsin has been added is allowed to stand for at least 24 hours. Vulcanizing ingredients (including 3% zinc oxide on dry rubber) are then added. This latex mixture will gel at a temperature of 85° C. The advantage of this method is that the product requires no water-wash, as do the other heat-sensitized processes in order to remove undesirable water soluble residues.

Finally we come to the German method of heat sensitization, in which the property of polyvinyl methylether (Igevin M50), to remain in solution at room temperature and become insoluble at 35° C., is utilized. Between 3-7% of polyvinyl methylether (on the dry rubber content)is added to the latex in the form of a 15% solution. This latex can be stored for many weeks at 25° C.; the polyvinyl methylether in solution acts as a stabilizer, but when the temperature is raised above 35° C., the polyvinyl methylether becomes insoluble and causes the destabilizing of the latex.

The use of metal molds has the advantage that great numbers of rubber reproduction can be produced from one mold; whereas with plaster molds, only limited num-

[1] Presented before the Division of Rubber Chemistry, A. C. S., Boston, Mass., May 25, 1949.
[2] British Rubber Producers Research Association, London, England.
[3] British patent No. 3,094.
[4] British patent No. 436,288.
[5] British patent No. 436,424.
[6] British patent No. 391,511. (See also India Rubber World, Oct., 1936, p. 35. Editor.)
[7] British patent No. 284,608.

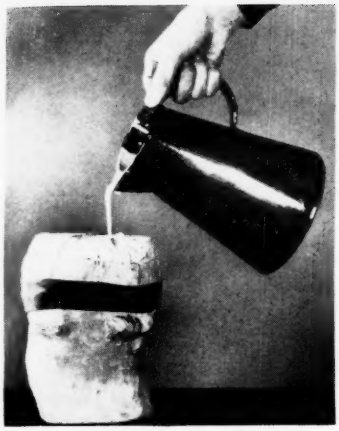


Fig. 2. The Mold Being Filled with Compounded Latex

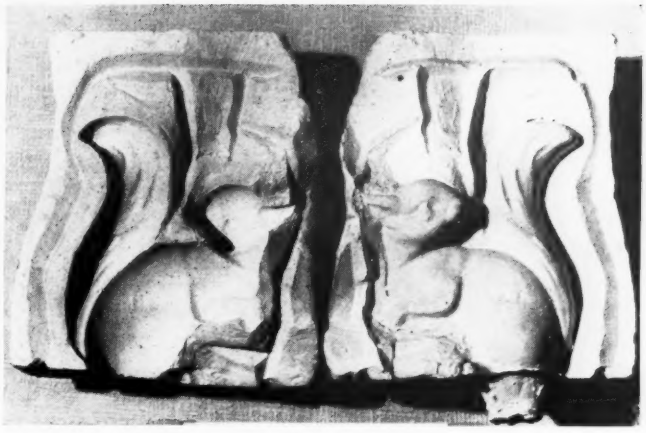


Fig. 3. The Opened Mold Containing Figure after Initial Drying

bers of articles can be reproduced owing to surface breakdown. More shrinkage, however, is apparent when metal molds are used; all the water in the deposit has to be dried out, and generally the operation is a more delicate one. With porous molds much of the water is "taken up" by the plaster, and they are particularly suitable where only small numbers of articles of certain design are required. This method has much scope where change of design is an important factor. Molds of plaster of paris are easy to produce, and a mold can be made of several pieces to accommodate intricate design. This method has thus proved suitable for the production of toys and general display models, including advertising, anatomical, and educational figures. The general method of manufacture is similar in all cases. The plaster mold is filled with latex and allowed to remain so until the necessary thickness has been deposited on the inside of the mold. The excess is then removed from the mold, and the mold (with deposit) is dried sufficiently to permit the mold to be opened and the molding to be removed without damage or distortion. The molding is then dried and vulcanized and finally cleaned and colored.

Soft Articles for Toys, Etc.

For advertising and similar figures it is necessary that the final material be as hard as possible while still of an "unbreakable" nature, but for toys, etc., products of various hardness may be required. Perhaps the most attractive toys prepared by this method are the "pure gum" specimens, which being hollow with an all rubber skin, are particularly suitable as floating bath toys. For the preparation of such toys prevulcanized latex appears the most suitable, but as the rubber skin is complete without a hole or vent, it is not practical to use heat for drying owing to the risk of bursting. This factor means that drying must be carried out at room temperature, and as the initial drying takes place while the toy is still in the mold, this condition necessitates that a toy monopolizes a mold for far too long a period.

A vulcanized concentrated latex would require some three hours' contact with a plaster surface to give a deposit sufficient to result in a final thickness of 2.5 millimeters. After the three hours' contact time the excess latex would be poured out, and the pouring hole plugged with a close fitting plaster bung to insure a continuous rubber film, but the mold could not be opened with safety for a further 12 hours. These long production times can be considerably curtailed by using flocculated latex, but care must be taken that the latex is not allowed to become too thick and thus hamper pouring. A latex flocculated by the addition of 25% of a 5% alum solution will give a deposit of 2.7-millimeter thickness after 30 minutes' contact with a plaster surface, compared with a thickness of 1.1-millimeters from untreated latex under similar conditions. Compared with the times of three hours and 12 hours mentioned above, a flocculated latex would require ½-hour and three hours for similar production.

Hard Figures

To obtain the required hardness for advertising figures it is necessary to incorporate fillers into the latex, and since the figures can be open-based or need not have the pouring hole plugged, drying can be carried out at elevated temperatures. Vulcanizable latex can therefore be used with advantage, and vulcanizing ingredients can be incorporated to suit the facilities at the manufacturer's disposal. Choice of fillers is important, as some fillers which can be used with advantage in dry rubber prove unsatisfactory when added to latex. Slate dust, for example, tends to promote coagulation; while pumice powder, although readily wetted, leads to considerable frothing and air occlusion. For self-colored goods, whiting and china clay can be used, with whiting for preference as it requires less water for wetting and promotes less froth than clay. The less water present in the latex mixture means, of course, less water to be got rid of during manufacture, and the use of a good wetting agent is therefore of utmost importance.

The presence of a wetting agent aids the stability of the latex mixture, which matter is of first consideration. Large proportions of wetting agent should, however, be avoided as not only do they increase froth formation, but also tend to retard the deposit build up and also subsequent drying. A recommended method of latex mixture preparation is to wet the filler with a 1% solution of suitable wetting agent; add the vulcanizing ingredients as dispersions, and grind the whole to a smooth paste in a suitable mill (e.g., cone or paint mill). The concentrated latex containing a small quantity of stabilizer—0.5% casein on the dry rubber content—is added to the filler paste, and after allowing this latex mixture to stand for 24 hours to allow the bubbles to rise, it is then ready for pouring into the molds. Up to 300 parts of whiting can be used with 100 parts of rubber, and no addition of a flocculating agent to this mix-

Fig. 4. The Molding after Curing

Fig. 5. The Finished Figure

ture is needed to insure sufficient deposit in a reasonable time. After 5-15 minutes' contact time the excess latex can be removed, and this excess mixture can be used again. The mold can then be heated at a temperature of up to 100° C. until the rubber film is sufficiently strong to allow the mold to be removed from it without distortion or rupture of the subject (the seam is particularly vulnerable).

Shape and design of mold and molding will influence the time and temperature needed for this initial drying but, as a guide, 30 minutes at 100° C. is usually sufficient. Once the molding is removed from the mold, it can be returned to the oven for final drying and vulcanizing. Time and temperature for this operation can again be varied to suit other considerations, but at a temperature of 100° C. the time necessary for final drying and curing is about one hour for a latex compound containing 1% ZDC (zinc diethyl dithiocarbamate) on the dry rubber.

As an example, the following mixture for hard figures is suggested:

	Parts by Weight
Latex (60% D.R.C.)	167
10% Casein solution	5
Whiting	300
50% Sulfur disperson	6
50% Zinc oxide disperson	10
33.1/3% ZDC	3
1% Wetting agent solution	78

With such high properties of filler present, the wet strength of the film is low, and if the molding is too intricate, it is impossible to remove it from the mold within reasonable time without causing damage. When such an intricate design is required, this difficulty can be overcome by using a double-pour method. The mold is first filled with the highly loaded latex to give the necessary hard finish, and immediately after the excess has been removed the mold is again filled, this time with a lightly loaded latex to give sufficient wet strength to enable the removal of the resultant two-layer figure. The excess latex of the second mixture is removed and procedure continues as described above.

Finishing

It is important, of course, that the final figure should have a smooth finish and be suitably colored. As the material is of such a hard nature, seam marks, etc., can be easily removed by the usual abrasive methods, and the surface can be painted, with cellulose finishes. The pure gum figures, mentioned earlier, are, however, much too flexible for the hard finish of a cellulose paint, but the use of oil soluble colors applied from solution to dye the rubber has been tried with success. The addition of aluminum stearate is advantageous to thicken the dye solution and enable clear-cut definition to be obtained. This method of coloring has the advantage of maintaining the attractive matt finish, which is usually desirable with pure gum articles.

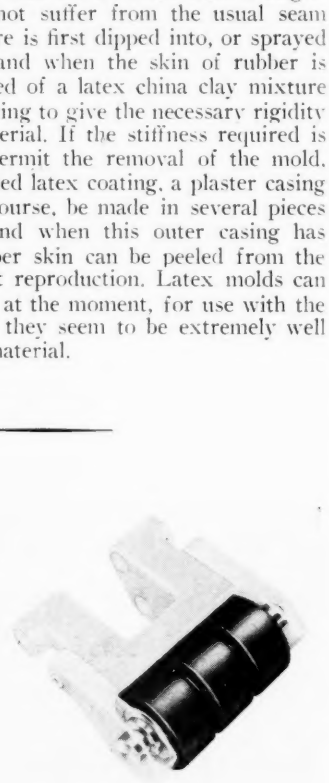
It will be gathered from the foregoing that the manufacture of figures from latex is comparatively simple, and that no great expense is necessary to operate the process successfully. Thus the existing manufacturer of *papier-maché* or plaster figures can change over to latex without great difficulty. Much of the technique is similar, and little alteration of plant is necessary.

Rubber Molds

Mention might now be made of the converse of the above method, where a plaster cast is made in a rubber mold. The replacement of gelatine by rubber for this purpose is fairly well established now, and much has been published describing methods for preparing rubber molds from latex. Little, however, has been written of the so-called "fluid rubber" for preparing molds, although such rubber was in all probability used for the purpose before latex rubber. For some figures the two-piece fluid rubber mold will have advantages over latex rubber, but in certain cases latex molds can be of great service. Wall plaques, and other casts that can be made from a single-piece skin mold, will not suffer from the usual seam marks. The master figure is first dipped into, or sprayed with vulcanized latex, and when the skin of rubber is formed, coats are applied of a latex china clay mixture to produce an outer coating to give the necessary rigidity to support the cast material. If the stiffness required is such that it will not permit the removal of the mold, then in place of the loaded latex coating, a plaster casing is made. This can, of course, be made in several pieces to facilitate removal, and when this outer casing has been removed, the rubber skin can be peeled from the casing, revealing perfect reproduction. Latex molds can be of particular interest at the moment, for use with the popular cast resins, for they seem to be extremely well suited for this type of material.

Pallet-Loader Wheel Kit

A RUBBER-TIRED, differential action, powered pallet-loader wheel replacement kit has been announced by Aerol Co., Inc., Burbank, Calif. The new wheel eliminates gouging and chipping of floors on sharp turns by means of a differential action obtained through a series of three independently rotating rubber-tired wheels. Each wheel is separated from the others on the axle by oil impregnated anti-friction thrust washers, and revolves on heavy-duty oilite bushings or sealed needle bearings.



Aerol Powered Pallet-Loader Replacement Wheel Kit

The rubber treads are shock absorbing and non-binding and in field tests are said to have given service life comparable to that of steel rollers and many times that of fiber wheels. Furnished as a complete, easy to install, replacement kit, the wheels do not require special tools or fixtures and come complete with detailed assembly instructions. They are available for such popular pallet-loaders as the Lewis-Shepard, Yale & Towne, and others.

Rebound Characteristics of Polymer Compounds at Various Temperatures[1]

B. G. Labbe[2]

SINCE the properties of rubber and rubber-like materials that help to characterize polymers at subzero temperatures cannot be determined by any single method of testing at the present time, any method that might serve to depict these properties should not be overlooked. Previous rebound tests at low temperatures have been reported by Howland[3] and by Mullins,[4] but in neither case were temperatures below -60° F. used. Howland experimented with a Bashore resiliometer; whereas Mullins conducted his tests with a pendulum rebound apparatus similar in principle to the Goodyear-Healy instrument. Because of the necessity of determining the suitability of polymer compounds for performance at low temperatures, the Office of Rubber Reserve requested experiments utilizing both instruments over a temperature range from 25° C. to -75° C. (77° F. to -103° F., respectively).

Experimental Details

The polymers and test recipes employed for this investigation at the Government Laboratories are shown in Table 1.

TABLE 1. COMPOUNDING RECIPES

Polymers	GR-S X-418	Polybutadiene XP-155	Natural Rubber	Butyl Rubber	Neoprene GR-M
			Parts		
Ingredients					
Polymer	100	100	100	100	100
EPC black	50	50	50	50	42.5
BRT #7	5.	5.	5.		
Zinc oxide	5.	5.	5.	5.	5.
Sulfur	2.	2.	3.	2.	
Altax	1.75	3.			
Captax			0.75	0.5	
Methyl tuads				1.	
AgeRite Powder			1.		
Light calcined magnesia					4.
Stearic acid		1.5	3.	3.	0.5

The optimum cure time for each compound was selected from the stress-strain data in Table 2 as follows:

TABLE 2. STRESS-STRAIN TESTS AT 77° F.

	Min. Cured at 292° F.	GR-S	Polybutadiene	Natural Rubber*	Butyl Rubber	Neoprene
300% Modulus lb./sq.in.	20	....	....	790	....	2920
	40	770	580	1190	530	3220
	60	1260	710	1340	660	3430
	80	1550	830	1440	770	3610
	100	1700	880	1420	850	3690
Tensile strength lb./sq.in.	20	....	....	3920	....	4050
	40	3090	1470	4230	2940	4010
	60	3530	1810	4070	3030	3990
	80	3580	1950	3970	2960	4070
	100	3170	1980	3890	2870	4040
Elongation, %	20	....	....	690	....	450
	40	740	560	650	770	390
	60	610	580	600	740	360
	80	560	540	580	690	340
	100	470	520	580	650	330
Set, %	20	....	....	33	....	8
	40	25	12	41	38	7
	60	17	13	40	40	6
	80	14	11	39	39	6
	100	10	9	35	36	5

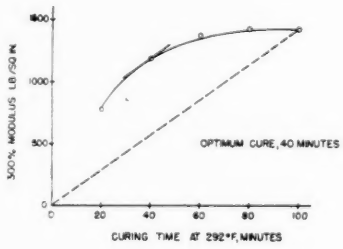
*Cured at 280° F.

(a) The 300% modulus values of specimens cured for 20 to 100 minutes were plotted, and a smooth curve was drawn through the points (Figure 1).

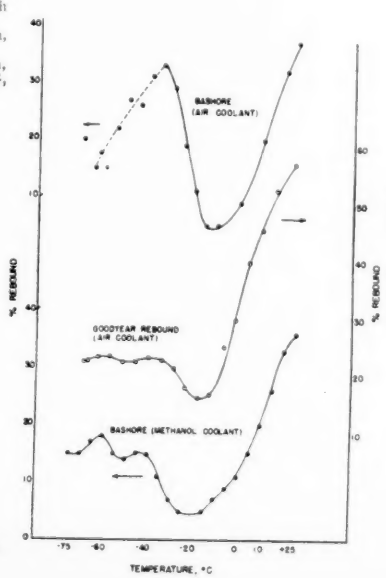
(b) The optimum vulcanization period was determined as the time corresponding to the point on the curve at which a tangent, drawn parallel to a straight line connecting the 0 and 100 minute values, touched the curve.

Specimens of the compounded stocks, one by one by two inches, with copper-constantan thermocouples inserted, were then cured for 10 minutes more than the determined optimum time.

[1] These experiments were conducted under the sponsorship of the Reconstruction Finance Corp., Office of Rubber Reserve, in connection with the government synthetic rubber program.
[2] Government Laboratories, University of Akron, Akron, O.
[3] L. H. Howland, W. E. Messer, V. C. Neklutin, V. S. Chambers, *Rubber Age (N. Y.)*, 64, 4, 459 (1949).
[4] *Trans. Inst. Rubber Ind.*, 22, 235 (1947).



(Above)
Fig. 1. Modulus *Versus* Time of Cure



(Right)
Fig. 2. Effect of Temperature on Rebound Testing of GR-S

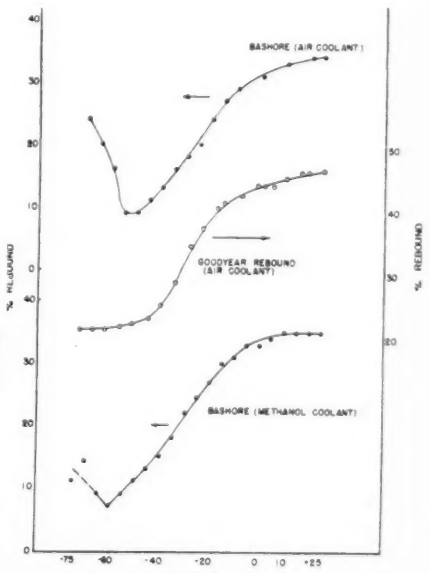


Fig. 3. Effect of Temperature on Rebound Testing of Polybutadiene

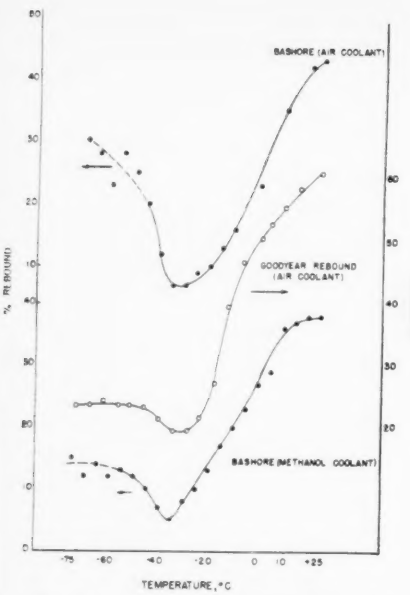


Fig. 4. Effect of Temperature on Rebound Testing of Natural Rubber

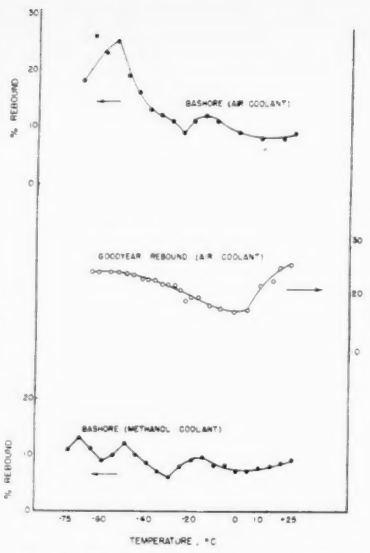


Fig. 5. Effect of Temperature on Rebound Testing of Butyl

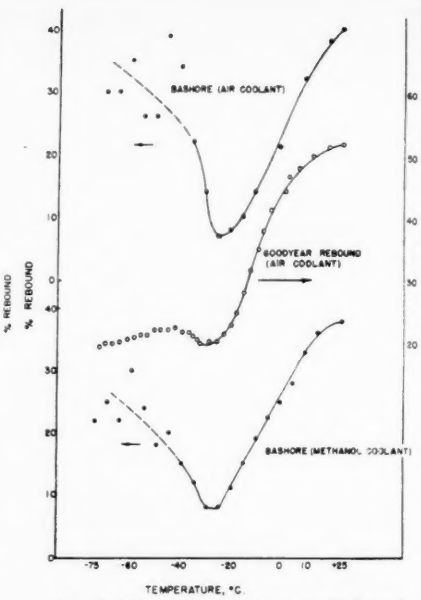


Fig. 6. Effect of Temperature on Rebound Testing of Neoprene

Actually three separate series of rebound tests were conducted on these polymer compounds: first, by the Goodyear-Healy method and then by the Bashore resiliometer method, the latter test both on samples cooled in methanol and dry ice and on specimens in a dry ice chamber with air as coolant.

The specimen holder of the Goodyear rebound apparatus was enclosed in a plywood chamber covered with two inches of rock wool batting and provided with a hole just large enough to permit entry of the impact hammer. This orifice was closed except at the time of test. Cool air was forced into this chamber after passing through a ¼-inch copper coil in a separate box packed with powered dry ice. Dry ice was also packed in the test specimen chamber. The thermocouple embedded in the specimen and another one placed as close as possible to the test surface were connected to a Brown Electronik indicating potentiometer. Rebound readings shown in the tables and figures are based on the temperature of the test block. The temperature was dropped as low as possible and held for at least 25 minutes before the first test was run. Five rebound determinations were made in each case; the fifth value was accepted as the true value. The pendulum was dropped from an angle of 15 degrees. Thereafter, the temperature was increased approximately 1° F. every minute by control of the flow of air to the chamber. Rebound was determined at 5° F. intervals up to 60 or 75° F.

These same test specimens were submerged in a methanol bath, and the Bashore resilience valves were determined at room temperature. Subsequently the temperature of the bath was decreased by 5° C. After 30 minutes at the new temperature, one specimen at a time was removed, wiped dry, and tested. This procedure was repeated until the temperature had been lowered to -75° C.

New test specimens (½ by 1¼ by two inches) were vulcanized for the Bashore resilience tests conducted in the subzero cabinet cooled by means of dry ice. The temperature was lowered to approximately -70° C., and the samples were conditioned for 40 minutes prior to testing. After the five specimens were tested, the temperature was allowed to rise 5° C. within the next 15 minutes, and the resilience values were determined 30 minutes later. This process was repeated every 5° C. up to room temperature, 25° C.

Discussion of Results

Tables 3 and 4 show the percentage rebound values determined with the Goodyear-Healy instrument and with the Bashore resiliometer. When plotted against temperature, the pendulum rebound values provided smooth curves; but once the minimum rebound value was attained, very little recovery was noted as the temperature was further decreased. This result was probably caused by vibration in the pendulum, although a reinforcing of ⅛-inch diameter was installed to eliminate this trouble. The actual transition point was not decisive.

TABLE 3. GOODYEAR-HEALY REBOUND DATA

	GR-S	Polybutadiene	Natural Rubber	Butyl Rubber	Neoprene
Min. Cured at 292° F.	80	70	50	50	40
Temp. °F.	Temp. °C.	Rebound, %			
75	23.9	52	46.8	61	25.4	37.4
65	18.3	51.5	...	59.4	24.8	35.9
60	15.6	51.5	46.4	58.4	22.2	32.5
55	12.8	50.1	46.4	55.9	20.0	49.6
50	10.0	49.6	45.5	55.4	21.6	45.9
45	7.2	48.2	45.0	53.4	18.0	42.4
40	4.4	46.8	44.1	52.9	17.2	40.2
35	1.7	44.6	44.6	51.0	16.6	34.6
30	-1.1	43.3	44.6	50.6	16.9	30.0
25	-3.9	41.5	43.3	48.7	17.4	25.4
20	-6.7	38.2	42.8	46.8	17.7	25.1
15	-9.4	35.3	42.8	42.8	17.7	18.6
10	-12.2	31.9	42.4	39.8	18.0	16.9
5	-15.0	28.2	41.5	31.5	18.9	16.3
0	-17.8	24.8	40.7	27.1	19.2	16.1
-5	-20.6	22.8	39.0	25.8	19.5	16.9
-10	-23.3	21.6	37.3	21.9	18.6	18.0
-15	-26.1	20.3	34.2	20.3	20.3	21.3
-20	-28.9	20.3	34.6	19.8	21.6	21.6
-25	-31.7	20.0	32.6	20.6	21.9	21.6
-30	-34.4	21.3	28.9	19.8	21.9	22.8
-35	-37.2	21.6	27.5	20.3	22.2	23.5
-40	-40.0	21.9	25.4	21.3	22.2	23.2
-45	-42.8	22.5	24.4	22.5	22.2	23.8
-50	-45.6	22.2	23.2	23.2	23.2	22.8
-55	-48.3	22.2	22.5	23.2	23.2	22.5
-60	-51.1	22.2	22.2	23.8	23.2	22.5
-65	-53.9	21.3	21.6	24.1	23.8	22.8
-70	-56.7	21.3	21.9	23.8	23.8	23.5
-75	-59.4	21.0	21.9	23.8	24.1	23.5
-80	-62.2	20.6	21.3	24.1	23.8	23.2
-85	-65.0	20.3	21.3	23.5	23.8	23.5
-90	-67.8	20.0	21.3	23.8	...	22.8
-93	-69.4	...	...	...	...	22.2

A study of the curves in Figures 2 to 6 discloses that

the first low rebound value in each case appears at the following temperatures:

Raw Polymer in Compound	Goodyear Rebound	Bashore Resiliometer	
		Methanol	Air
		Temperatures, Minus °C.	
GR-S	26	25	25
Polybutadiene	62	60	50
Natural rubber	28	35	30
Butyl	1	*30	*25
Neoprene	18	15	10

*First low rebound value below 0° C.

Both methods involving the Bashore resiliometer indicated a more definite transition point than is discernible by the Goodyear method. The erratic rebound values below the first transition point may or may not be actual properties of the individual polymer compounds. The use of methanol and dry ice indicates that minimum rebound values appear at temperatures about 5° to 10° C. below those obtained in the subzero cabinet. Undoubtedly this difference resulted from a rapid rise in temperature of the surface of the test specimens as soon as they were removed from the coolant.

Although the values obtained in this investigation do not appear to correlate with data of other low temperature tests, subsequent studies of rebound tests at low temperatures may disclose more decisive transition points and a valuable subzero property of the polymers investigated.

From the data presented and the curves in Figures 2 to 6, inclusive, it appears that the best method is the use of the Bashore instrument in the dry ice cabinet. The time element for testing is quite important, since eight to ten specimens can be tested by the preferred method compared to about six specimens using methanol coolant with the Bashore instrument and one specimen in the Goodyear-Healy apparatus, all at approximately the same cost.

TABLE 4. BASHORE RESILIOMETER DATA

Min. Cured at 292° F.	GR-S	Polybutadiene	Natural Rubber	Butyl Rubber	Neoprene
Temp., °C.		Methanol as Coolant; Rebound, %			
25	38	35	38	9	36
20	37	35	38	9	33
15	36	35	37	8	26
10	33	35	36	8	20
5	28	34	29	7	15
0	25	33	27	7	11
−5	23	33	23	8	9
−10	19	31	20	8	7
−15	15	30	17	10	5
−20	11	27	13	9	5
−25	8	25	10	8	5
−30	8	22	8	6	7
−35	12	18	5	7	11
−40	15	15	7	9	15
−45	20	13	10	10	15
−50	18	11	12	12	14
−55	24	9	13	10	15
−60	30	7	12	9	18
−65	22	9	14	11	17
−70	25	14	12	13	15
−75	22	11	15	11	15
		Air as Coolant; Rebound, %			
25	40	34	43	9	37
20	38	34	42	8	32
15	...	...	...	...	...
10	32	33	35	8	20
5	...	...	...	...	...
0	21	31	23	9	9
−5	...	...	...	...	...
−10	14	29	16	11	5
−15	10	27	13	12	5
−20	8	24	10	11	11
−25	7	20	9	9	19
−30	14	18	7	11	29
−35	22	16	7	12	33
−40	34	13	12	13	31
−45	39	11	20	16	26
−50	26	9	25	19	27
−55	20	9	28	25	22
−60	35	16	23	23	15
−65	30	20	28	26	15
−70	30	24	30	18	20

Summary and Conclusions

The data obtained at extremely low temperatures are rather erratic and of doubtful value for selecting a compound for any definite low-temperature property. From the results of these experiments, however, it is quite evident that the Bashore resiliometer, with air as the coolant, is preferred over the Goodyear-Healy apparatus mainly because of efficiency and economy of operation. The hardening of the test sample after the temperature at which low rebounds are recorded is more evident in the Bashore method.

Additional Experimental GR-S Polymers and Latices

ADDITIONS to the list of experimental GR-S dry polymers and GR-S latices, available for distribution to rubber goods manufacturers under the conditions outlined in our November, 1945 issue, page 237, appear in the table printed below.

Normally, experimental polymers will be produced only at the request of the consumers, and 20 bales (one bale weighs approximately 75 pounds) of the original run will be set aside, if possible, for distribution to other interested companies for their evaluation. The 20 bales, when available, will be distributed in quantities of one bale or two bales upon request to the Sales Division of Rubber Reserve, or will be held for six months after the experimental polymer was produced, unless otherwise consigned before that time. Subsequent production runs will be made if sufficient requests are received.

These new polymers are experimental only, and the Office of Rubber Reserve does not make any representations or warranties of any kind, expressed or implied, as to the specifications or properties of such experimental polymers, or the results to be obtained from their use.

X-Number Designation	Manufacturing Plant	Date of Authorization	Polymer Description
X-521-GR-S	Goodyear, Torrance	11-10-49	Mooney viscosity is now 47 ±7 instead of 55 ±5.
X-526-GR-S	U. S. Rubber, Borger	11-1-49	GR-S polymerized at reduced reaction temperature with cumene hydroperoxide activated recipe emulsified with Dresinate 214. Shortstopped with dinitrochlorobenzene. Stabilized with 1.25% BLE. Mooney viscosity, 50. (X-526 number was originally cancelled, but is now reissued for another polymer.)
X-539-GR-S	Goodyear, Torrance	5-17-49	GR-S stabilized with PBNA to be used as the standard reference test sample beginning July 1, 1949.
X-540-GR-S	Firestone, Lake Charles	5-31-49	GR-S polymerized at reduced reaction temperature with cumene hydroperoxide activated recipe emulsified with Dresinate 731. Shortstopped with dinitro chlorobenzene. Mooney viscosity, 57 ±7.
X-541-GR-S	Firestone, Lake Charles	5-23-49	Same as GR-S-45-AC except for modifier. Shortstopped with hydroquinone. Mooney viscosity, 36 ±4.
X-542-GR-S	Goodrich, Port Neches	7-20-49	GR-S polymerized at reduced reaction temperature with cumene hydroperoxide activated recipe emulsified with Dresinate 214. Shortstopped with dinitro chlorobenzene. Stabilized with 1.25% Stalite. Mooney viscosity, 55.
X-543-GR-S	Goodyear, Houston	5-24-49	GR-S-20 polymerized to slightly lower conversion.
X-544-GR-S Latex	U. S. Rubber, Naugatuck	6-15-49	Charge ratio 70 parts butadiene and 30 parts styrene polymerized at 50° F. maximum with cumene hydroperoxide recipe emulsified with potassium soap. Shortstopped with YNA (dimethyl ammonium dimethyl dithiocarbamate). Total solids, 49.5% maximum.
X-545-GR-S	General, Baytown	7-21-49	A mixture of 50 parts Philblack 0 and 100 parts of GR-S polymerized at reduced reaction temperature with cumene hydroperoxide activated recipe emulsified with Dresinate 731 and shortstopped with dinitro chlorobenzene. Mooney viscosity of latex, 37. Stabilized with 1.5% PBNA

EDITORIALS

President's Rubber Recommendations Too Restrictive

THE most important criticism that can be directed at the President's recommendations for new rubber legislation is that, as in many other phases of life in these United States, "the government is trying to be too much, for too many people, and at all times." The result is inevitable—the recommendations are contradictory, confusing, and permit no other conclusion but that the government wishes to retain a large measure of control of the synthetic rubber industry for an indefinite period.

In spite of the exhaustive treatment of the whole subject in the Steelman report which accompanies the President's recommendations and which is entitled "Maintenance of the Synthetic Rubber Industry in the United States and Disposal of Government-Owned Synthetic Rubber Facilities," it is evident that the government planners do not feel that they can be satisfied with the authority to insure a minimum production and use of about 200,000 long tons of synthetic rubber a year in the United States, while leaving the actual production and sale up to private industry. They require instead that they be permitted to designate what facilities remain in use, what the minimum level of use must be, authority to specify the amount of GR-S which must be incorporated in such products as may be selected, and authority to produce and sell synthetic rubber up to the prescribed minimum, but with no obligation to produce and sell more than that minimum if the rubber goods manufacturing industry requires it.

It is true that disposal of the synthetic rubber producing facilities of the government is recommended "as soon as possible," but the proposed limitations on such disposal are of the nature that it is hard to see how private industry could become interested in buying any of the plants.

The government planners seem so preoccupied with the problem of preventing any one company, particularly any of the Big Four rubber companies, from getting a headstart in the synthetic rubber field that the recommendations as now written, if adopted by the Congress, would probably discourage almost all of the companies from embarking upon the production of synthetic rubber on a private industry basis with the purchase of one or more of the government plants.

The President's recommendations have been referred to the Armed Services Committee in both the Senate and the House of Representatives. In the Senate the Banking and Currency Committee will also consider that part of rubber legislation involving the Reconstruction Finance Corp., that is, the disposal of the government plants. Senator Millard Tydings of Maryland, heads the Armed Services Committee, and Senator Burnet Maybank of South Carolina, the Banking and Currency Committee. The House Armed Services Committee is headed by Rep. Carl Vinson of Georgia.

The Senate Armed Services subcommittee on rubber legislation will probably have as chairman Senator Lyndon Johnson of Texas, whose views are strongly pro-administration. Senator John Bricker of Ohio should be in charge of the Banking and Currency subcommittee. The Rubber Act of 1948 was mostly the work of Senator Bricker as head of the Banking and Currency subcommittee, which had exclusive jurisdiction on rubber legislation in the Senate at that time.

The 1948 rubber legislation in the House was formulated by Rep. Paul Shafer of Michigan and then Rep. Lyndon Johnson of Texas. The so-called Shafer Bill of 1948 was at first unacceptable to industry, but not so unacceptable as the bill proposed by Representative Johnson. The Shafer Bill after modification was compromised with the Bricker Bill, and the Rubber Act of 1948 was the result.

Representative Shafer, who will be a member of the 1950 House Armed Services subcommittee on rubber legislation, has already criticized the President's recommendations as "asking too much for too long". In this attitude he will find support in the rubber industry. He has now proposed a new program that would provide for three-year legislation: specification controls to assure consumption of 150,000 long tons of GR-S a year, but such controls to be used only when industry failed voluntarily to consume this amount; production of 200,000 tons of GR-S the first year only to "prevent serious dislocation of business"; authority to offer all government synthetic rubber plants for sale immediately; and the removal of all controls on Butyl rubber, effective July 1, 1950, and no authority to continue such controls.

The industry committee on rubber legislation of The Rubber Manufacturers Association, Inc., began a series of meetings to discuss the President's recommendations almost as soon as they were made public. It is understood that concrete proposals which this group believes can safeguard national security without the necessity of continuing rigid government controls for another ten years will be submitted at the Congressional hearings, the first of which are scheduled by the House subcommittee for the third week in February.

In contrast to the position taken by the government planners, India RUBBER WORLD feels that with termination of the patent pool and exchange of information agreements on synthetic rubber, with the very great likelihood of a continuing shortage of good-quality natural rubber for the next several years, and with the very good possibility of worldwide rubber consumption of more than 2,000,000 tons a year for the next several years, all the government needs in the way of rubber legislation is authority to assure the production and use of a national security minimum of synthetic rubber, leaving the mechanics of that production and use to private industry. New legislation should, however, centralize administration, including stockpiling, under one head.

DEPARTMENT OF
PLASTICS TECHNOLOGY

Some Notes on the Injection Molding of Polystyrene—II[1]

Grant W. Cheney[2]

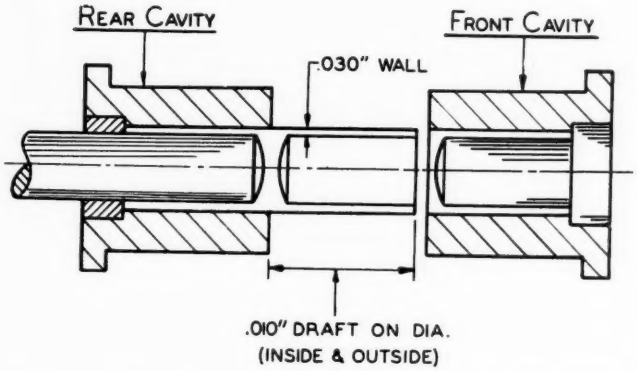


Fig. 4. Difficult Mold Design Requires Withdrawing Plastic from between Both Mold Walls at the Same Time

THE following installment concludes the informative article on injection molding polystyrene, which began in our January issue.

Sticking of Plastic Parts in the Mold

Sticking of polystyrene parts in the mold is a matter which has vexed molders and designers severely. The mold designer provides as much draft as he can, and the tool maker avoids undercuts while he polishes the mold to a mirror finish; but still the parts stick. Most molders and mold designers realize also that designs such as shown by Figure 4 are difficult to mold. This difficulty arises from the fact that the plastic must be withdrawn from between both mold walls at the same time. It is wise to avoid such designs, or to ease the molding operation by shorter draws, and reasonably heavy walls.

Figure 4 also serves to illustrate the principal factors involved when an injection molding sticks in the mold. The plastic may enter the mold under hydraulic pressure at, or near, 8,000 p.s.i. according to the best available information. The mold is a closed pressure vessel which expands, or, to use a more convenient term, is strained. Strain is elastic deformation, and in this case it is a function of the plastic pressure. This deformation causes the metal to exert a force which squeezes the plastic as hard as the plastic pushes against the mold walls. This force, or the plastic pressure, multiplied by the area of those cavity walls approximately parallel to the direction of the draw, multiplied by the co-efficient of the friction between plastic and metal, is approximately the force required to open the mold. In some cases it is so large that the injection molding machine cannot equal it, and the mold is stuck shut.

Fortunately the plastic shrinks in the mold as it cools. This action allows the mold walls to return wholly, or partly, to their unstrained position. Yet another factor enters the picture at this point. Polystyrene is a compressible material. At 450° F., under an applied pressure of 16,000 p.s.i., the material is compressed, and the volume is reduced by approximately 6.8%. This condition is admittedly more severe than exists under most ordinary molding conditions. However, when pressure is applied, the plastic is always compressed to some extent. Therefore in order to reduce the force which holds the mold shut, shrinkage of the plastic must be sufficient to do two things: (1) it must be sufficient to alleviate the tendency of the plastic to expand to the extent that it has been compressed by the applied pressure; and (2) it also must be sufficient to allow the mold walls to return to the unstrained position. If the actual plastic pressure in the cavity is not too high, shrinkage will ordinarily be sufficient to allow both of these things to happen, and the moldings release readily from the cavity.

Releasing the molding from the core after it has been removed from the cavity is another story. Briefly, the force holding the plastic to the core is due, mostly, to elastic deformation of the plastic. The deformation of the plastic is a result of the shrinkage which occurs during cooling. The holding force in this case is a function of the modulus of elasticity and tensile strength of the plastic. It is also dependent upon the thickness of the part and the amount of cooling which occurs in the mold. Relatively thick sections may release more easily from the core because the center may be warmer at the time of ejection. Therefore shrinkage is less, and the molding releases more easily.

The above discussion of forces within a mold is made without regard to the type or formulation of the injection molding compound. It appears that the best plastics for mold release are those which can be molded at the lowest hydraulic pressures and which have the lowest moduli of elasticity. Lubrication of the plastic formulation would appear to affect mold release by allowing lower molding pressure as well as by reducing the coefficient of friction between plastic and metal.

Draft appears not to be highly important in some instances. Many times it has been observed that large area deep draw molds have been stuck shut although plenty of draft allowance was made. Reworking the mold to make more draft has been found to be ineffective in some such cases. Stiffening the mold to prevent elastic bending of the cores often has been a disappointment.

Many field observations have been made in which all the well-known factors for minimizing sticking have been tried—more draft, elimination of undercuts, relocation of gates, high polish, dull finish, more hold-down screws, and others, all without achieving very much in regard to the elimination of the sticking. These observations lead to the conclusion that the chief and predominant cause of sticking may be high internal pressure within the mold. Certainly some recent work in the reduction of pressure within the mold has had consistent results in minimizing sticking. Certain ways of doing this work will be pointed out a little later in the discussion.

Restricted Gating

Restricted gating has been a subject of much interest in recent months. In the molding of polystyrene several definite advantages may be obtained from the use of this type of gating. These advantages may be listed as follows: (1) ease and convenience in trimming of the gate; (2) reduction of residual molding stresses, particularly in the area near the gate; (3) reduction of warpage of parts; (4) increased craze resistance; (5) increased temperature resistance; (6) shorter cycles in some cases; (7) wider range of mold temperatures possible; (8) less necessity of cold slug trap; (9) reduction of actual plastic pressure in the cavity in some cases; (10) increased ease in balancing of gates on multiple-cavity shots.

The first item, ease and convenience in trimming the gate, needs no further discussion. It is something everyone has always wanted, and now can be obtained. Residual molding stresses in the area of a large gate are likely to be excessive and may cause warpage or cracking of the part. The use of the restricted gate may eliminate or greatly reduce both of these conditions. These stresses are probably a result of the differential rate of cooling which occurs in the molded part. The plastic in the area of the gate is usually the last part to cool, and shrinkage and warping in this area may occur on removal from the mold. A large thick gate or

[1] Presented before Society of the Plastics Industry (Canada), Inc., Royal York Hotel, Toronto, Ont., Canada, June 14, 1949.
[2] Dow Chemical Co., Midland, Mich.

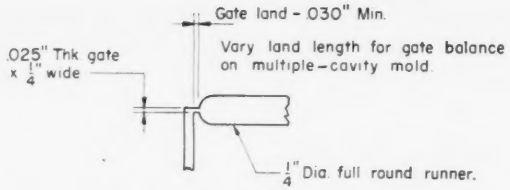


Fig. 5. Typical Restricted Edge Gate for Single- or Multiple-Cavity Mold

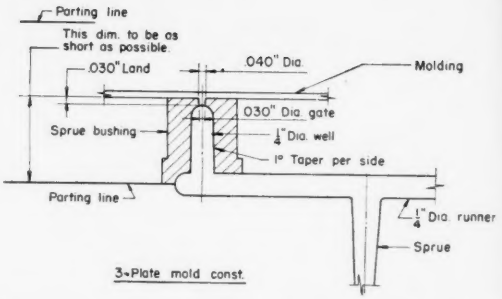


Fig. 6. Typical Restricted Center Gate for Multiple-Cavity Mold

sprue may contain sufficient heat further to retard cooling in this area, and this aggravates the condition. In order to avoid the warping which occurs, a common correction is to allow the plunger to stay forward longer. Then as cooling and shrinkage occur, the increased pressure may cause severe stresses in the area near the gate. On the other hand, a restricted gate freezes almost immediately when the filling of the mold is complete. This freezing minimizes further transmission of pressure into the cavity and also minimizes the effect of shrinkage of the gate and the runner in the adjacent area. Thus these stresses are minimized.

Warpage, crazing, and the heat distortion temperature of the molded polystyrene part are dependent to a very great extent upon residual molding stresses. To the extent that the restricted gate reduced such stresses, it is effective in reducing warpage and crazing and in increasing the heat distortion temperature.

The restricted gate will allow faster cycles in some cases, but not in others. With the conventional gate it may be necessary to wait for the gate, runner, or sprue to cool. Also the heat in a large gate, runner, or sprue may be sufficient to retard the rate of cooling in the gate area. Both of these factors may cause the cycle to be longer than necessary. In such cases the restricted gate will reduce the cycle if additional heating capacity is available to heat more material.

Because the restricted gate does freeze more rapidly it makes somewhat higher mold temperatures possible on a practical basis. This factor is important in the production of high quality moldings, as has been indicated previously.

When the plastic passes through the restricted gate, it is difficult to imagine that any very large piece of unmelted material can pass through. Furthermore some computations have been made recently to show that the temperature rise of polystyrene, shot through a restricted gate in such a manner that a pressure loss of 10,000 p.s.i. occurs, may be in the neighborhood of 50° F. Thus it seems to be unnecessary to provide traps to catch cold material.

There are indications that the restricted gate is of some assistance in reducing effective pressure in the mold cavity. Field observations using the restricted gate have shown the actual pressure in the mold cavity to be somewhat less than when the conventional unrestricted gate is used. To the extent that it does reduce effective pressure in the cavity, the restricted gate is effective in reducing sticking of the part in the mold.

In the application of restricted gating, loss of pressure through the small opening becomes a very important consideration. If this pressure loss is large, the flow of plastic may be sufficiently retarded to allow cooling and hardening of the plastic in the cavity to increase the resistance to flow enough to prevent complete filling of the cavity, or to necessitate unreasonable, large injection pressure. The shorter the length of the restricted section of the gate, the smaller this pressure loss will be. If the gate is 1/32-inch in length or less, the pressure loss is very small. Recent experience has shown that this restricted section may be as little as 0.030-inch in length without danger of the thin metal edge breaking through into the cavity as the result of the applied pressure. Regarding the size of the gate, it has been established that thicknesses ranging from 0.020- to .035-inch, with widths ranging from ⅛- to ¼-inch, are usually adequate for parts up to at least eight ounces in size. On larger shots it may be necessary to increase the thickness to as much as 0.070-inch. In one specific case a shot well over 40 ounces was molded successfully through a gate approximately ¼-inch wide by 0.025-inch thick.

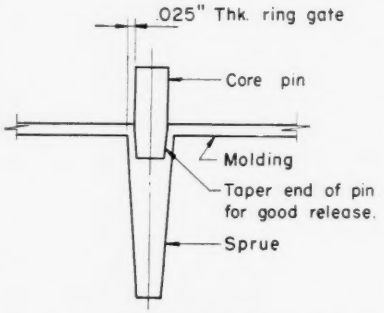


Fig. 7. Typical Restricted Center Gate at Cored Hole in Single-Cavity Mold

Restricted gating has been used on a large number of molds with very good results. Some results have not been too good, but generally, improvements in toughness, dimensional stability and accuracy, heat resistance, and surface finish have been found, and sometimes faster cycles are possible. It is believed that the practice of restricted gating principles, properly applied, will allow the molding of far more complex parts of polystyrene than has ever been possible before. This possibility is primarily because the restricted gate goes a long way in reducing the demand for moldability of the plastic. It should be made clear that it is not a universal solution to all molding difficulties. Other variables must be given adequate consideration also.

Figure 5 shows a typical restricted gate as applied to an edge gated part. The runners are full round, as this shape is considered the most efficient from the standpoint of pressure loss. The gate is at the center of the runner. This position is important as the velocity of the plastic in the center of the runner is relatively high, decreasing to approach zero at the contact surfaces where chilling and solidification occur rather quickly. Runner diameter sizes in the range of ¼-inch are usually adequate for pieces as large as 16 ounces or more.

Figure 6 shows a typical restricted gate as applied to a center gated part in a multiple-cavity mold. This arrangement necessitates a three-plate mold construction to allow removal of sprue and runners. Again, ¼-inch diameter runners and sprues are usually adequate for rather large-size shots.

Figure 7 shows a typical restricted gate as applied to a center gated part on a single-cavity mold where a cored hole occurs at the point of attachment of the sprue. This method is good for reducing the effective size of the sprue and reducing the differential cooling stresses which may result therefrom. It also may shorten the cooling time required for the sprue and allow somewhat shorter cycles.

Figure 8 shows how the sprue size may be reduced effectively where it must be attached directly to the molding. Extending the nozzle of the heating cylinder into the front half of the mold in the manner shown allows the use of a very much shorter and smaller diameter sprue. It is useful, particularly where an ejector mechanism on the front half of the mold makes a long sprue necessary.

Balanced Gating

On the multiple-cavity shots, balancing of the gate so that all cavities fill uniformly is extremely important, particularly with the use of restricted gating. If flow through a restricted gate ceases momentarily, the gate may freeze, making it impossible to start flow again with the available pressure. It is therefore necessary that flow be uniform and continuous into all cavities once it has started into the cavities. When this condition is attained, the pressure transmitted into all cavities is also uniform. Thus the possibility of parts sticking in the mold because excessive plastic pressure is transmitted to some cavities is eliminated. Gate balancing may be accomplished by adjusting the cross-sectional area of the gate slightly, or by adjusting the length of the restricted portion by a somewhat greater amount.

In connection with balancing of gates, perhaps a word of caution is in order. It is possible to be fooled into opening up the wrong gate. Figure 9 illustrates how this error may happen. The short shot shown on condition No. 1 normally indicates that the gate on cavity B should be increased slightly in thickness. In rare cases this condition has been found incorrect, and condition No. 2 shows what may have happened. The gate on cavity A was slightly small, and flow did not start in this cavity until cavity B was filled to the short shot line indicated on condition No. 1. At this point, flow stopped in cavity B and started in cavity A, which then filled completely. Solidification then pre-

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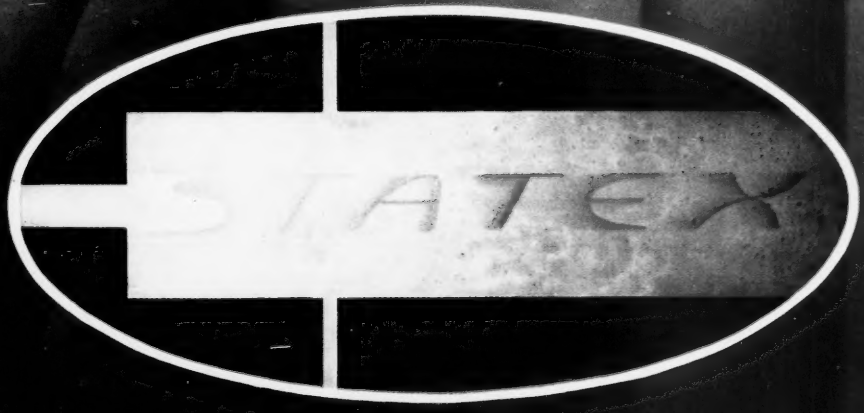

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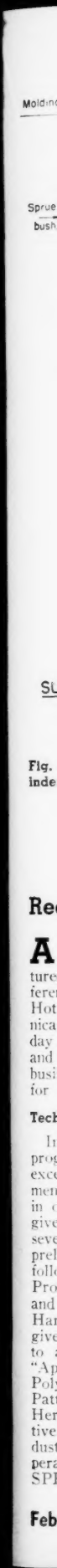

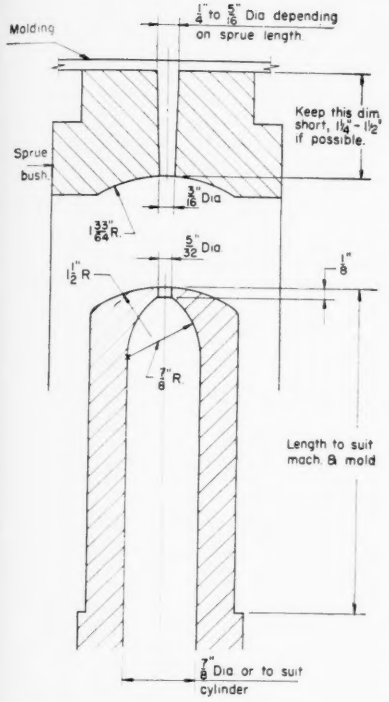

Fig. 8. Suggested Design for Extending Cylinder Nozzle into Front Half of Mold to Reduce Sprue Size

vented completion of filling in cavity B. Thus it is evident that the gate on cavity A should have been opened up rather than that on cavity B, as was at first supposed.

It is not possible to do a proper job of balancing gates unless the mold temperature is somewhere near the optimum over the entire surface of the mold. It may be necessary that the front half of the mold operate at a different temperature from that of the rear half, but before the gates can be balanced it is necessary that the mold be at the temperature where it should run. This requirement is essential because the mold temperature has a considerable effect upon the fluidity of the plastic within the mold, and at the time the mold is filling the fluidity changes rapidly. To the extent that mold temperature affects the fluidity, it is a critical item in allowing the mold to fill at reduced pressures.

In the case of a certain six-cavity mold having improperly balanced gates, plastic flow apparently started in the center cavities, then started in the end cavities, stopped, partially chilled, and then started again. Surface defects are liable to appear on the molding as a result of this arrested flow condition. The unbalanced condition also allows excessive pressure to be transmitted to the center cavities, causing poorer mold release, as previously discussed.

In another unbalanced six-cavity mold the two center pieces invariably cracked on ejection. Reduced gates and runners on the center cavities resulted in uniform pressure throughout all cavities, with relatively less pressure transmitted to the center cavities, making ejection without cracking possible.

Summary and Conclusions

Some of the more important considerations in building and operating a mold for the injection molding of polystyrene have been discussed. Specifically, the subjects of plastic flow control, mold temperature control, sticking of parts in the mold, restricted gating, and gate balancing have been mentioned. Admittedly, very much more could be said upon each of these topics. Also a large number of other variables equally deserve consideration. On critical jobs difficulties have been encountered when only one of these many factors was neglected. All of these variables must be given proper attention if high-quality moldings are to be obtained. If this discussion has succeeded in stimulating further thought along the lines of giving more attention to these variables, it has accomplished its purpose.

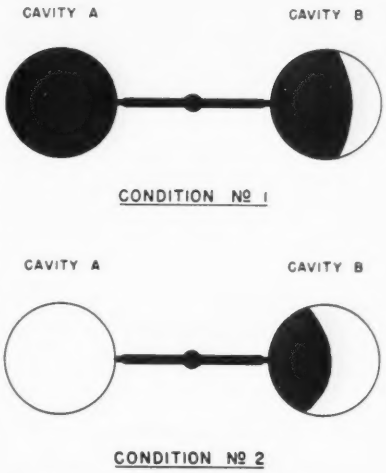

Fig. 9. Drawing Showing Effects of Improper Gate Balancing

Record Attendance at SPE National Conference

A TOTAL registration of approximately 550, a new attendance record, featured the SPE sixth annual technical conference, held on January 11-13 at the Hotel Carter, Cleveland, O. Nineteen technical papers were presented at the three-day meeting, which also included luncheon and banquet sessions, the Society's annual business meeting, and a separate program for ladies.

Technical Sessions

Intense interest was displayed in the program of technical papers, which was of excellent quality. The preliminary installment of abstracts of these papers appeared in our January issue, and the balance are given elsewhere in this report. There were several changes in the program from the preliminary one previously published, as follows: the papers on "The Electrosol Process," by M. J. Ainsworth, consultant, and "Powder Extrusion," by E. Green, Hartig Engine & Machine Co., were not given owing to the inability of the authors to attend the Conference; the paper on "Applications for Low Molecular Weight Polyethylene" was presented by C. W. Patton, Bakelite Division; P. A. Belk, Hercules Powder Co., spoke on "Informative Labeling"; and H. A. Meyrick, Industrial Mfg. Co., gave a paper on "Temperature Control and Mold Design." Two SPE committee reports were also given: M. R. Gerow, Reynolds Metals Co., spoke on the work of the professional activities committee; and Jerome Formo, Minneapolis-Honeywell Regulator Co., reported on the activities of the quality control committee.

Abstracts of Technical Papers

Of the 19 technical papers presented at the Conference, abstracts of 12 papers together with an abstract of the talk by Mr. Thiessen at the luncheon session appeared in our January issue. The following abstracts cover the balance of the technical papers given during the three-day session:

"Restricted Gating for Large Castings." W. P. Gobeille, Nash-Kelvinator Corp., Milwaukee, Wis.

All our molding jobs on large parts at present are employing our conception of the restricted gate technique. Some of the problems involved in restricted gating are discussed, with typical parts as examples. By use of this technique we have been able to achieve better surface finish, greater strength, improved molding cycles, and lower finishing costs on the molded parts. It is believed that this technique makes mold gating a science rather than an art, and that there will eventually be standards covering the gating of different types of parts with different types of materials.

"Informative Labeling." P. A. Belk, Hercules Powder Co., Wilmington, Del.

The work of the SPI committee on informative labeling is reviewed. An informative label should give the generic name and trade name of the plastic material used in the part, together with information on advantages of the material and instructions for care and maintenance. Different types of informative labels are demonstrated and discussed. An SPI questionnaire on informative labeling was sent out to the industry several months ago to clarify all questions. Results of this survey are being correlated at present and will be announced soon.

"Long-Wave Radiant Heating for Plastics." Thomas F. Walsh, Sill Industries, New York, N. Y.

The continued growth of the plastics industries is emphasizing the need of better heating equipment to provide higher and more uniform temperatures, better control of those temperatures, and lower operating costs. A new development to meet this demand is the Fibre Glass Super-Heater, a radiant heating panel built to any size to suit any operation. This heater gives four major advantages in plastics operations: it develops completely uniform surface temperature; the temperature can be controlled at any point in a range from 120-700° F.; the heat developed is "black heat" in the infrared range; and the cost of operating the unit is so low that in many areas it compares favorably with gas or steam heating.

"Applications for Low Molecular Weight Polyethylene." C. W. Patton, Bakelite Division, Union Carbide & Carbon Corp., New York.

Low molecular weight polyethylene resins have molecular weights ranging up to 15,000. From 15,000-24,000 the resins are considered medium molecular weight types; while those above 24,000 are the high molecular weight types. The low molecular weight resins are used primarily in potting and sealing compounds and as additives to wax compounds for coating papers. The properties of these resins are discussed in detail, together with their advantages and limitations, and examples are shown of typical applications.

"Electronic Heating Devices." Edward J. Wohlfarth, Mayflower Electronic Devices, Inc., West New York, N. J.

This paper reviews some of the case histories of plastic parts made with the use of electronic heating devices developed by Mayflower. Some of these articles are rainwear, shower curtains, tablecloths, toys, lamp shades, paper bags, luggage, pocketbooks, sportswear, clothing, and cloth labels.

"What's New in Mold Making." J. L. Morrison, Detroit Mold Engineering Co., Detroit, Mich.

The equipment that comprises a mold making shop is basically the same as it was 15 years ago. The main change in tool room machinery has been in quality, rather than in kind or type of equipment. The late war forced the development of machines having greater accuracy, and many of these machines have found their way into the plastics tool rooms since the war. In size, at present, mold making equipment is roughly paralleling the growth in size of molding machines.

In the field of mold steels, much work has been directed toward improving hobbing steels and with considerable success. New steels have been developed that give greater strength and hardness, together with improved purity and uniformity. A new development is the Sperry Reflectoscope which can be used to check flaws in die blocks prior to machining and thus avoid costly waste of time and labor in making molds.

"Temperature Control and Mold Design." H. A. Meyrick, Industrial Mfg. Corp., Indianapolis, Ind.

Temperature control of molds and mold design is a "must" where uniformity of quality and maximum production are desired. To accomplish good temperature control it is necessary that the mold design be such as to utilize to best advantage the heating and cooling method employed.

Some of the factors that must be correlated to achieve maximum benefits follow: relation between temperature variations in a mold and the mold design; causes and permissible tolerances for these temperature variations; relation between molding cycles and temperature sensitivity; location and dimensions of water channels, and their connections to the mold and the controlling equipment; and use of proper measuring and recording equipment to provide results to assist in better mold design.

Luncheon and Banquet

Approximately 246 members and guests attended the luncheon session on January 11, presided over by retiring President Mario J. Petretti, Rogers Plastic Corp. Mr. Petretti spoke briefly, reviewing the achievements of the Society during the past year, and then announced the election of the following new national officers for 1950: president, C. Todd Clark, F. Burkart Mfg. Co.; vice president, Islyn Thomas, Thomas Mfg. Corp.; secretary, Robert L. Davis, Continental Can Co.; and treasurer, W. O. Bracken, Hercules. The luncheon was followed by a talk on "Raw Materials of the Plastics Industry" by Gilbert Thiessen, Koppers Co., Inc.

New SPE National Officers: (*L. to R.*) Vice President Islyn Thomas, President C. Todd Clark, Secretary Robert L. Davis, and Treasurer W. O. Bracken

The banquet on January 12 featured a talk by Howard E. Fritz, B. F. Goodrich Co., and the presentation of the prize paper contest awards, and was followed by an evening of dancing. Speaking on "Your Right to Think (A Sixth Sense)," Dr. Fritz said that the foremost research problem now facing this country was to contribute more to the stockpile of basic and fundamental scientific information known as "pure research." Reliance in this country must be placed on the output of scientific minds, rather than on illusory ideas of security for everyone, Dr. Fritz declared.

"Man has struggled through many centuries of despair and destitution before the 'right to think' was finally granted him, and if he surrenders that right for paternalistic benefits, the sun will begin to set on the greatness of this nation," the speaker concluded.

Annual Business Meeting

The Society's annual business meeting was held on January 12, with Mr. Petretti presiding. Reports were heard from the various committee chairmen during the past year, following which the new national officers were introduced and installed into office. The new president then announced appointment of the following national committee chairmen: professional activities, G. A. Peck, Stromberg-Carlson Co.; publications, M. W. Osborne, B. F. Goodrich Chemical Co.; membership, E. Earle; speakers, S. L. Young, C. F. Church Mfg. Co.; prize paper contest, H. M. Richardson, DeBell & Richardson, Inc.; finance, W. F. Oelman, Standard Molding Corp.; auditing, F. Burkhart, Burkart Mfg., meetings, R. L. Huber, Hercules; and publications, Mr. Petretti.

George W. Clark, Owens-Illinois Glass Co. and chairman of the 1949 prize paper contest, announced the prize winners, as follows: first prize, "Injection Molding of De-Rating Materials," J. C. Stokes, Perry Plastics Co., and A. R. Morse, Injection Molders Supply Co.; second prize, "Mechanical Equation of State, with Special Attention to Creep of Plastics," W. N. Findley, University of Illinois; and third prize, "Rheometer Flow Studies of Cellulose Acetate and Cellulose Acetate Butyrate Molding Compounds," D. A. McGraw, Owens-Illinois Glass. The session concluded with the presentation of the prize papers by their respective authors.

Reports on Section Meetings

Torch Welding of Thermoplastics

The Western New England Section held its first regular dinner-meeting of the year on January 4 at the Sheraton Hotel, Springfield, Mass. Approximately 55 members and guests heard H. M. Richardson, DeBell & Richardson, Inc., speak on torch welding of thermoplastics. An account of torch welding in England and a demonstration of the process were given by S. B. King, also of DeBell & Richardson, Inc.

Torch welding of polyethylene and polyvinyl chloride sheets, rods, extrusions, and wire coverings appears to be of greatest interest. The process provides a means of joining and fabricating polyethylene, where no adhesive is available, and for making quick, efficient bonds and seals with all types of vinyls. One of the applications demonstrated was the repair of vinyl covered cable by the fusion of a vinyl plastisol repair patch. Another interesting application is the welding of couplings and fittings to polyethylene pipe. Other applications demonstrated were the welding of polyethylene sheet and film, the joining of acrylics, and the fusion of high styrene copolymers.

The meeting was presided over by the new Section president, Edward W. Vaill, Bakelite Corp. Other new officers are: vice president, Herbert Hasenzahl, American Optical Co.; secretary, Robert W. Crawford, Monsanto Chemical Co.; and treasurer, M. H. Nickerson, DeBell & Richardson. Door prizes in the form of melamine dishware sets were awarded through the courtesy of the Parker Stamp Works Co.

Newark, New York Sections Meet Together

The Newark Section was host to the New York Section at a dinner-meeting on January 11 at the Military Park Hotel, Newark, N. J. More than 125 members and guests of both Sections heard two talks: Irving Copland, Monroe Plastics, Inc., spoke on "Pinpoint Gating of Heavy Sections"; and John K. Boosahda, consulting engineer, discussed the "Development of Plastics in India."

Mr. Copland described some of the development work done by his company on the injection molding of heavy sections through restricted gates. Examples of butyrate screw-driver handles were shown to illustrate some of the techniques developed. It was emphasized that accurate mold temperature control and much patience were the two primary requirements to produce good moldings. The importance of running an injection machine 24 hours a day, seven days a week, in order to

attain and maintain balanced operating conditions was stressed. According to the speaker, a period of 48 hours may be required to reach such balanced conditions.

Mr. Boosahda described the development of the Indian plastics industry. In 1946, with little or no plastics machinery being exported, a total of 16,000 pounds of polystyrene was shipped to India. For the first nine months of 1949, a total of $487,000 worth of extruders and injection molders was exported to India, together with more than 2,000,000 pounds of plastics materials, mainly polystyrene. This trend, however, cannot be expected to continue unless the average standard of living in India is raised considerably, the speaker declared. Most plastics items being produced in India are novelties, toys, and combs; while industrial applications are relatively rare.

In the short business session preceding the talks, Newark Section President R. B. Akin, E. I. du Pont de Nemours & Co., Inc., announced the appointment of the following committee chairmen: professional activities and educations, C. J. Frosch, Bell Telephone Laboratories; membership, E. K. Preston, Koppers Co., Inc.; credentials, E. W. Spitzig, Newark Die Co.; publicity, John Groesbeck, American Hard Rubber Co.; house, A. Naturale, Thomas Mfg. Corp.; program, J. E. Meyer, General Electric Co.; *SPE Journal* reporter, J. R. Pecktal, Tennessee Eastman Corp.; and budget, Mr. Akin, assisted by E. B. Soules, Detroit Mold Engineering Co., and E. W. Rowan, Dillon Beck Mfg. Co.

Day Addresses Rochester Section

Approximately 35 members and guests of the Rochester Section attended a regular dinner-meeting on January 16 at Redmans Club, Rochester, N. Y. Featured speaker at the meeting was George L. Day, Lake Erie Engineering Corp., who discussed many of the considerations involved in press design and reviewed the problems confronting the press designer. In the business session preceding the talk, the group discussed the organization of a cash prize program for original technical papers on plastics.

Borkland Describes European Trip

A regular joint dinner-meeting of the Chicago Section, SPE, and Midwest Chapter, SPI, was held January 11 at the Builders Club, Chicago, Ill. An attendance of some 60 members and guests of the two groups was present and heard G. W. Borkland, Borkland Laboratories, Inc., speak on "The Plastics Industry and General Business Conditions in Europe." The speaker described his experiences and opinions obtained on a recent trip through Europe from the Scandinavian countries to Italy.

Frederick Reelected

D. S. FREDERICK, Rohm & Haas Co., was reelected president of the Plastic Materials Manufacturers Association, Inc., Tower Bldg., Washington 5, D. C., at the annual meeting in New York, N. Y., on January 19. F. N. Williams, Monsanto Chemical Co., was reelected vice president; F. H. Carman was reelected secretary-general manager, and J. E. Walker became treasurer. M. G. Milliken, Hercules Powder Co., E. D. Ries, E. I. du Pont de Nemours & Co., Inc., and J. L. Rodgers, Jr., American Cyanamid Co., were elected directors. J. R. Hoover, B. F. Goodrich Chemical Co., and A. N. Mann, Catalin Corp., continue on the board; while P. A. Macy, Perkins Glue Co., remains as chairman of the resin adhesives division.

Mr. Frederick states that in spite of the low level demand for some plastic materials during the second and third quarters of last year the requirements for many types of plastics are now taxing the capacity of the manufacturers. It now appears that new records to total plastics production were set in 1949, and producers look for continued high levels of production in 1950.

CALENDAR

Feb. 17.	Chicago Rubber Group. Morrison Hotel, Chicago, Ill.
Feb. 17.	Northern Indiana Section, SPE. Van Orman Hotel, Fort Wayne, Ind.
Feb. 18-26.	National Sportsmen's Show. Grand Central Palace, New York, N. Y.
Feb. 24.	Detroit Rubber & Plastics Group. Spring Meeting. Detroit Leland Hotel, Detroit, Mich.
Feb. 27-Mar. 3.	ASTM Spring Committee Week. Pittsburgh, Pa.
Feb. 28.	Washington Rubber Group.
Mar. 2.	Southern Ohio Rubber Group. Engineer's Club, Dayton, O.
Mar. 2-4.	Pacific Coast Section, SPI. Spring Conference. Hotel Del Coronado, near San Diego, Calif.
Mar. 6.	Philadelphia Section, SPE.
Mar. 6-17.	Annual American Toy Fair. New York, N. Y.
Mar. 7.	The Los Angeles Rubber Group, Inc. Hotel Mayfair, Los Angeles, Calif.
Mar. 8.	Chicago Sections, SPE and SPI. Builder's Club, Chicago, Ill.
Mar. 13.	Upper Midwest Section, SPE.
Mar. 13-15.	National Association of Waste Material Dealers, Inc. Thirty-Seventh Annual Convention. Waldorf-Astoria Hotel, New York, N. Y.
Mar. 15.	South Texas Section, SPE.
Mar. 17.	Boston Rubber Group. Spring Meeting. Somerset Hotel, Boston, Mass.
Mar. 17.	Northern Indiana Section, SPE. Van Orman Hotel, Fort Wayne, Ind.
Mar. 23.	Quebec Rubber & Plastics Group. Canadian Legion Hall, Montreal, P.Q., Canada.
Mar. 24.	Chicago Rubber Group. Morrison Hotel, Chicago, Ill.
Mar. 28.	Washington Rubber Group.
Mar. 28-31.	National Plastics Exposition. Navy Pier, Chicago, Ill.
Mar. 31.	Akron Rubber Group. Spring Meeting. Mayflower Hotel, Akron, O.
Apr. 3.	Philadelphia Section, SPE.
Apr. 4.	The Los Angeles Rubber Group, Hotel Mayfair, Los Angeles, Calif.
Apr. 10.	Upper Midwest Section, SPE.
Apr. 12.	Chicago Sections, SPE and SPI. Builder's Club, Chicago, Ill.
Apr. 19.	South Texas Section, SPE.
Apr. 20.	Quebec Rubber & Plastics Group. Canadian Legion Hall, Montreal, P.Q., Canada.
Apr. 21.	Northern Indiana Section, SPE. Van Orman Hotel, Fort Wayne, Ind.
Apr. 24-27.	American Management Association. Nineteenth National Packaging Exposition. Navy Pier, Chicago, Ill.
Apr. 25.	Washington Rubber Group.
May 1.	Philadelphia Section, SPE.
May 2.	The Los Angeles Rubber Group, Inc. Hotel Mayfair, Los Angeles, Calif.
May 8.	Upper Midwest Section, SPE.
May 10.	Chicago Sections, SPE and SPI. Builder's Club, Chicago, Ill.
May 12.	Chicago Rubber Group. Morrison Hotel, Chicago, Ill.
May 17.	South Texas Section, SPE.
May 19.	Northern Indiana Section, SPE. Van Orman Hotel, Fort Wayne.

National Plastics Exposition

THE National Plastics Exposition, to be held at the Navy Pier, Chicago, Ill., on March 28-31, will feature a huge display by the SPI of more than 100 case histories of the industrial and commercial uses of plastics. To be shown for the first time at the Exposition, the display will include both static and animated exhibits. The announcement was made by Exposition Chairman Dale Amos, Amos Molded Plastics, who also announced a specific theme for the show: "Plastics build better products and better values."

The SPI will also sponsor a conference at the Stevens Hotel, Chicago, on the mornings of March 29 and 30, at which nationally recognized authorities will discuss distribution, merchandising, marketing, and selling of plastics. Two other developments in connection with the Exposition were also announced. The first is that exhibit space already contracted for in December exceeds the total for the New York show in October, 1948. The second is that the Chicago Sales Executive Club will have a "Salute to Plastics" dinner at the La Salle Hotel on the eve of the Exposition, March 27.

Teflon Mold Release Finish

PRELIMINARY results on the use of a very thin coating of Teflon Polytetrafluoroethylene Finish as a mold release agent have been announced by E. I. du Pont de Nemours & Co., Inc. These finishes now available in field-test quantities, can be sprayed on to metal to impart remarkable anti-sticking properties, it is claimed. While these finishes are not presently applicable to extremely complex mold cavities, the company believes that the finishes will be found useful in many of the simpler molds.

In the du Pont laboratory a slab mold to which a Teflon Finish was applied has been used for more than a hundred heats without the need of a conventional mold lubricant, and not one case of sticking has been encountered. Barring mechanical damage of the film, the coating appears to last indefinitely since it shows no apparent change, and there are no signs of a build-up in any of the mold cavities. Further information on these finishes may be obtained from the company's fabrics and finishes department, Room 7147, Du Pont Bldg., Wilmington 98, Del.

Scientific and Technical Activities

Washington Group Meeting on President's Rubber Recommendations

THE Washington Rubber Group held a meeting on January 24 at the Cosmos Club, Washington, D. C., on the subject of the President's recommendations for new rubber legislation and the accompanying report by John R. Steelman, assistant to the President. The meeting consisted of a discussion of the recommendations and the report by a panel of experts, all of whom were members of the government committee responsible for the preparation of the Steelman report, as follows: moderator, Gerald Hadlock, Office of Rubber Reserve, RFC; Arthur Wolf, National Security Resources Board; Frederick D. Bates, Jr., Munitions Board, Department of Defense; Earl W. Glenn, Department of Commerce.

Chairman of the meeting was Theodore Werkenthin, Bureau of Ships, Navy Department. Attendance totaled about 150 members and guests of the Group.

In the course of the discussion and the question and answer period it was stated that in connection with proposed new legislation the government's primary interest is national security, not the protection of private industry. Private operators of copolymer plants would get no protection through government production of synthetic rubber except that incident to whatever the government does by way of producing or requiring usage, solely in the interests of national security.

In connection with the sale of a copolymer plant, but with no accompanying butadiene plant (or any number of copolymer plants and no butadiene plants), the government will supply monomers necessary for GR-S production to copolymer plant purchasers.

It was pointed out that one "fundamental flaw" in the present law and the proposed new law is that any company which developed a new tire rubber has no assurance that it will be classified as a general-purpose rubber and eligible for use to meet mandatory consumption requirements. In reply, it was said that any rubber that could be shown useful in tires would be classified as a general-purpose rubber, equal in status to GR-S for specification usage, but, of course, it would be up to the Administration to decide. This answer did not completely satisfy the questioner, who said he didn't think any company would take the risk of developing a new synthetic rubber, not knowing who would be President or rubber director by the time the research produced something usable.

Although the proposed legislation leaves open the return to specifications on other than tires, the government experts asserted that return to broader product specifications was not contemplated.

The government will fill the gap between minimum security production of 200,000 long tons of GR-S a year and demand exceeding that amount, although the wording of the recommendations states that the government is not obligated to do so. The "no obligation" clause was inserted so that the government would not be required to use synthetic rubber production as a lever against a possible rise in the price of natural rubber it was said.

In the field of research on synthetic rubber, the present program will continue as long as the government is the sole producer and distributer of GR-S. As private industry becomes a producer of synthetic rubber and undertakes its own research of the applied or development type, the government will reduce its research of that type and concentrate on basic research, which will be its eventual major activity in the research field.

In general, the most important observation that might be made as far as this Washington Group meeting is concerned is that in both industry and government, many are still confused as to what the Steelman report contains as well as what it recommends.

The next meeting of the Group will be held on February 28, Pentagon Building, Washington, D. C. The feature of this meeting will be an exclusive showing of the new motion picture, "Malaya," which stars Spencer Tracy, James Stewart, John Hodiak and Sidney Greenstreet.

Washington Group Hears Cole

THE Washington Rubber Group held its fourteenth regular meeting on January 6 at the Cosmos Club, Washington, D. C. Speaker of the evening was Otis D. Cole, Firestone Tire & Rubber Co., who gave "A Discussion of the Service Characteristics, Compounding, and Physical Properties of Some of the Newer Synthetic Rubbers."

Dr. Cole presented a summary discussion of recent work on the structure, properties, and service characteristics of low temperature polymers as compared with natural rubber and standard GR-S. It was shown that the rapid loss of physical properties shown by natural rubber stock during oxidation is accompanied by a loss of crystallinity of the stock, as indicated by preliminary X-ray and stress relaxation data. The speaker stated that further work along this line will be published at a later date.

Los Angeles Group Party

THE largest and most successful Christmas Party in the history of The Los Angeles Rubber Group, Inc., took place on December 9 at the Los Angeles Breakfast Club. Some 400 members of the Group, their wives, and guests attended the affair, which included a cocktail hour, dinner, and evening of dancing. Much of the credit for the successful party should go to Committee Chairman R. D. Abbott, R. D. Abbott Co., assisted by George A. Steinbach, Merit Western Co.; J. B. Larkin, Patterson-Ballagh Co.; A. J. Hawkins, E. I. du Pont de Nemours & Co., Inc.; W. A. Del Mar, Adamson United Co.; F. C. Johnson, Caram Mfg. Co.; F. A. Thistle, Typrene Roller Co.; B. R. Snyder, R. T. Vanderbilt Co., Inc.; and B. Del Guerra, L. A. Standard Rubber Co., Inc.

1948 Chairman Phil Drew (*Left*) Presenting Honorary Life Membership Certificate to R. B. Stringfield, a Founder of the Los Angeles Rubber Group

Features of the party were the presentation of a Life Membership Certificate to R. B. Stringfield, Fullerton Mfg. Co., one of the Group's founders, and the installation of the Group's new officers for 1950. These officers and directors are as follows: chairman, E. C. MacLaughlin, H. M. Royal, Inc.; associate chairman, Mr. Abbott; vice chairman, R. L. Short, Kirkhill Rubber Co.; secretary, Carl Hoglund, Goodyear Tire & Rubber Co.; treasurer, L. E. Budnick, Ohio Rubber Co. of California; and directors, C. H. Churchill, Sterling Rubber Products Co.; W. J. Haney, Kirkhill, Mr. Hawkins, and D. C. Maddy, Harwick Standard Chemical Co. Table favors consisting of lipstick cases were distributed to all the ladies present.

Plans for the Group during the coming year were outlined by Chairman MacLaughlin at the combined committee meeting on January 10 at the Mayfair Hotel. Some 50 members were in attendance, and all committees were well represented. The various committees and their chairmen follow; auditing, R. N. Phelan, Atlas Sponge Rubber Co.; current events, B. E. Biheller, H. Muehlstein & Co.; golf, R. L. Bowen, Xylos Rubber Co.; membership, Mr. Thistle; prize, Mr. Del Guerra; reception, Tway Andrews, Royal; technical, Dickson Sheppard, Goodyear; year book, Charles Kuhn, Master Process Corp.; educational, Phil Drew, Goodyear; placement bureau, Al Pickard, Braun Corp.; and photography, A. R. Hromatka.

Because of the interest aroused in its first course in Basic Rubber Technology, the Group's board of directors has arranged to repeat the course for the benefit of other members of the organization. The class will be given for 15 Monday evenings, from 7:00 to 10:00 p.m., starting on February 20, in the laboratory of H. M. Royal, Inc., Vernon, and will be conducted by the same instructors as for the first course. Enrollment will be limited to 22 members. The cost to the student is $15 for the course, and the balance of the expense is covered by the Group.

D'Ianni To Discuss Resins

THE Detroit Rubber & Plastics Group, Inc., will hold its next regular dinner-meeting February 24 at the Detroit Leland Hotel, Detroit, Mich. Featured speaker will be James D. D'Ianni, research department, Goodyear Tire & Rubber Co., who will talk on "Butadiene-Styrene Resinous Copolymers."

SORG Elections

THE Southern Ohio Rubber Group has announced the results of its recent elections for new officers and directors for 1950. The new officers follow: chairman, R. B. Sucher, Inland Mfg. Division, General Motors Corp.; chairman-elect, L. J. Keyes, Dayton Rubber Co.; treasurer, T. C. Argue, Inland Mfg.; and secretary, R. J. Hoskin, Inland. The new directors elected to three-year terms are: Herbert Karch, C. P. Hall Co.; Jos. Rockoff, Dayton Rubber; and J. M. Walsh, Xylos Rubber Co. Other directors include R. S. Radow, Dayton Rubber, J. E. Feldman, Inland; G. E. Lang, Premier Rubber Mfg. Co.; R. H. Marston, Binney & Smith Co.; A. J. Marshall, Naugatuck Chemical Division, United States Rubber Co.; and H. R. Gill, Goodyear Tire & Rubber Co.

The Group's next meeting, to be held at the Engineer's Club, Dayton, on March 2, will feature a talk by W. A. Wiard, Dow Corning Corp., on "Silastic, Its Properties and Place among Synthetic Rubbers."

Rubber Engineering Discussed

A TALK on "Engineering with Rubber," by M. O. Orr, The B. F. Goodrich Co., Akron, O., featured the January 10 dinner-meeting of the Ontario Rubber Section, C.I.C. Approximately 60 members and guests attended the meeting, which was held in Hart House, University of Toronto, Toronto, Ont.

Rubbers, both natural and synthetic, are today among the most versatile engineering materials available, Mr. Orr said. Synthetic rubbers have broadened the scope of usefulness of rubber; while new applications for rubbers and plastics of all types have greatly extended the horizons of the rubber and the plastics industries. The speaker described some of the latest commercial applications for rubber and also discussed the outlook for new discoveries and new materials as a result of continued research in Canada and the United States.

Boston Group Party

THE Boston Rubber Group concluded another year of continued activity with a highly successful Christmas party on December 16 at the Somerset Hotel, Boston, Mass. Approximately 410 members attended the affair which included a cocktail hour, dinner, business session, entertainment program, and the distribution of many door prizes.

The business session featured the election of officers for 1950, with the following results: chairman, Harry W. Sutton, Boston Woven Hose & Rubber Co.; vice chairman, Thomas C. Edwards, Acushnet Process Co.; and secretary-treasurer, John Andrews, Godfrey L. Cabot, Inc. Alan Bryant, Binney & Smith Co., P. A. Uva, Avon Sole Co., and Bernard H. Capen, Tyer Rubber Co., were elected to the Group's executive committee. Harold P. Fuller, Pequanoc Rubber Co., continues as permanent historian of the Group.

The Group will hold its next regular meeting on March 17 at the Somerset Hotel, with the speaker and his topic to be announced at a later date.

Kem-Ban—Protective Coating

A NEW rust inhibiting protective coating compound, designed to meet the demands of maintenance coating and production finishing applications in industry for effective protection of exterior surfaces exposed to atmospheric and other corrosive conditions, is being marketed by Ace Laboratories, Lakewood, O. Called Kem-Ban, the new material is based on a specially selected copolymer as the binder and incorporates certain rubber derivatives as plasticizers. The formulation is said to provide, for the first time in a single material, both effective rust inhibiting action and excellent resistance to acids, alkalies, chemical fumes, moisture, salts, and alcohols.

Kem-Ban can be applied by spray, brush, or dip methods and shows excellent adherence to all ferrous and non-ferrous metals and alloys, galvanized surfaces, clad metals, and even polished and stainless steels. It is equally applicable to wood, linoleum, and composition flooring and provides these surfaces with high resistance against scuffing, abrasion, foot traffic, and marring. The material is also suitable for use as a sealer for hot plaster, stucco, cement, concrete, and other alkaline materials.

Hycar Valve Seats

PROPANE is handled with maximum safety in cylinders and tanks equipped with safety relief valves manufactured by Weatherhead Co., Cleveland, O. These relief valves use a specially designed Hycar rubber valve seat, approved for use on cylinders up to 150 pounds propane capacity by the ICC. The same material is used for approved spring-type safety relief valves on greater capacity tanks by the A.S.M.E.

The major problem in making safety relief valves was to find a suitable composition for the valve seat that would not stick to metal. This problem was solved by use of a compound made by Acushnet Process Co., New Bedford, Mass., from Hycar rubber, a product of B. F. Goodrich Chemical Co., 324 Rose Bldg., Cleveland 15, O.

Hydrophobic Starch Derivative

DRY-FLO, a new hydrophobic derivative of corn starch that may have broad commercial possibilities, has been announced by National Starch Products, Inc., New York, N. Y. Available for product research and development, the new material is a finely divided powder with the silky texture and is free-flowing to the extent that it behaves like a liquid in many ways. The presence of the hydrophobic groups makes Dry-Flo extremely difficult to wet with water under ordinary conditions. It can be wet with water if a wetting agent is used, or if the dry material is first wetted with alcohol or other water-miscible solvents.

Potential applications for the new product include rubber dusting; flatting agent in lacquers; detackifying agent for rubber dipped goods; anti-halation powder for photographic films; prevention of sticking of viscous materials to container walls; lubricating agent; and cosmetic powders.

White Discusses "Cold Rubber"

SIXTY members and guests of the Quebec Rubber & Plastics Group attended a meeting on January 12 at Canadian Legion Hall, Montreal, P.Q. Speaker of the evening was L. M. White, United States Rubber Co., who discussed "The Major Influences of 'Cold Rubber' on the Industry."

Dr. White noted that "cold rubber" represents a major advance over the older-type GR-S and gives improved tensile, elongation, cut growth rate, tread cracking rate, and wear resistance. The differences in molecular structure of GR-S and "cold rubber" and the effect of these differences on properties were discussed. The use of fine furnace black is of paramount importance for bringing out the desirable qualities of "cold rubber," the speaker pointed out. Without the development of the fine furnace blacks the use of "cold rubber" would have been greatly retarded. Dr. White emphasized that "cold rubber" is not a replacement for natural rubber, but is a new rubber raw material for the industry. The advent of "cold rubber" has also aroused the natural rubber producers to the point where they are improving on natural rubber to make it more competitive with "cold rubber," Dr. White added.

Silicone Mold Lubricant

A NEW silicone mold release emulsion, designated G-E 81161, for use on molds for rubber tires, soles and heels, rubber and vinyl floor tiling, and plastics, has been announced by General Electric Co., Pittsfield, Mass. The emulsion is diluted and sprayed on the molds and, because of its resistance to heat, hard water, freezing, mechanical agitation, and centrifuging, prevents molded parts from sticking to the mold. The emulsion will resist temperatures as high as 250° C., and does not decompose to produce gases, tarry residue, or build-up, the manufacturer further claims. This characteristic helps eliminate gas pockets which so often cause rejects.

The new product also eliminates the danger of discoloring light-colored molded parts. When used in dilutions of 0.5%, and in some cases 0.25%, the emulsion may be applied to the mold with a spray gun or atomizer. Since the emulsion does not contain any solid particles, it will not clog the nozzle of the spray gun.

New Resin Adhesive

ARMSTRONG PRODUCTS CO., Warsaw, Ind., has announced a new thermosetting resin adhesive for bonding a large variety of materials to each other, including metals, glass, ceramics, rigid plastics, wood, rubber, etc. Designated as Adhesive A-1, the material provides a glue line often stronger than the materials being bonded. The adhesive is unique in that it contains no volatile solvent and does not shrink or swell upon hardening. The entire composition sets up to a rigid solid and can be used to fill gaps.

Proper use of the adhesive demands clean surfaces for application. No primer coating or open assembly drying is required. The surfaces to be bonded are

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RUBBER WORLD

NEWS of the MONTH

President's Rubber Recommendations Submitted to Congress; FTC Quantity Discount Hearings Held Despite Objections from the Rubber Industry

The President's recommendations for new legislation on rubber to replace the Rubber Act of 1948, which expires June 30, 1950, were submitted to Congress on January 14. The accompanying report of more than 100 pages by John Steelman, assistant to the President, included detailed recommendations and much factual data on the national and world-wide rubber industry. Legislation of 10-year duration, annual consumption of not less than 200,000 long tons of GR-S in the United States, disposal of the government's synthetic plants as soon as possible, but under many restrictive clauses, continued specification controls on both GR-S and Butyl rubber, continued authority to produce and sell synthetic rubber, and continued authority to conduct research on synthetic rubber were the major points covered.

Senate and House Armed Services Committees were selected to develop necessary legislation, and House hearings begin in February. Legislation may be more pro-control than in 1948 by virtue of change from Senate Banking Committee to Armed Services Committee for formulation. Rep. Paul W. Shafer, Republican of Michigan, chairman of 1948 House subcommittee on rubber legislation, expressed sentiments that may be those of the rubber industry when he said President's recommendations "ask for too much for too long."

Additional year-end statements were optimistic for a good year for the rubber industry both in the United States and Canada. The Goodyear company predicted 15% higher replacement tire sales in 1950 than in 1949 as a result of a recent survey.

The Big Four companies and Montgomery Ward sought an injunction to restrain the Federal Trade Commission from continuing its hearings on the proposed tire quantity discount rule, but this action was denied by the Federal District Court in Washington, D. C. Written briefs were therefore filed on January 17 and oral hearings are scheduled for February 7.

Negotiations between the United Rubber Workers of America and the Goodyear and the Firestone companies on pension and insurance plans were resumed, and other companies are discussing or planning to discuss these matters, but the outlook for new agreements in the immediate future is not too hopeful.

The President's Synthetic Rubber Recommendations

As required by The Rubber Act of 1948 (Public Law 469, 80th Congress), the recommendations of the President for legislation to replace the 1948 law, which expires on June 30, 1950, were submitted to the Congress on January 14. Support for the President's recommendations was found in a report from the assistant to the President, John R. Steelman. The complete text of the President's recommendations and Mr. Steelman's report are obtainable from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., for 40¢. The publication, which is 121 pages in length, contains a wealth of information and is an exhaustive treatment of the entire subject of rubber in the United States. The full title follows: "Synthetic Rubber — Recommendations of the President — Transmitted to the Congress together with a Report on Maintenance of the Synthetic Rubber Industry in the United States and Disposal of Government-Owned Synthetic Rubber Facilities— From The Assistant to the President — January, 1950."

Included in the President's recommendations are the following important observations and comments:

"The tremendous increase in the use of rubber is one of the outstanding features of our industrial development in the last 50 years. Rubber has become indispensable to the United States, in both peace and war.

"It is essential to our national security that facilities to produce enough high quality synthetic rubber to meet our needs in an emergency be continuously available. We must build up a stockpile of natural rubber, and we have been doing so, but the accumulation of a stockpile large enough to meet all emergency needs for rubber is impractical. We must be equipped to meet the bulk of our needs from domestically produced rubber.

"The rubber policy of the United States should be based upon the fundamental national objectives of protection of the national security, promotion of a free competitive economy, and achievement of a peaceful and prosperous world. I recommend that legislation succeeding the Rubber Act of 1948 be enacted, setting forth this rubber policy, and providing for continuation of the synthetic rubber industry in a manner consistent with these objectives."

The specific recommendations are next given, but since they are spelled out in more detail in Mr. Steelman's report, they will be reprinted from there rather than from the President's statement to avoid duplication.

In conclusion, the President said:

"I believe the policies outlined in this message and the detailed recommendations contained in the accompanying report provide a sound program for action. For this reason, the legislation establishing these policies can be of relatively long duration. Furthermore, a firmly established legislative framework is highly desirable if disposal of the Government's synthetic rubber plants is to be successful. I recommend the adoption of legislation of ten years' duration in order to provide adequate protection of national security and to contribute to the development of a vigorous, competitive, and privately owned synthetic rubber industry in the United States."

Detailed Recommendations

1. It is recommended that the President be given authority to designate the specific synthetic rubber facilities which, in his judgment, are necessary to provide the synthetic rubber capacity needed for national security and the common defense.

2. A continuation of the present policy of top maintenance with respect to stand-by rubber plants is essential in the interest of national defense. It is, therefore, recommended that the President also be authorized to maintain in adequate stand-by such non-operating rubber-producing facilities in whole or in part, as he may designate.

3. It is recommended that the President be authorized:

(a) To establish the minimum level of production and consumption of general-purpose synthetic rubber which in his judgment is necessary in the interest of national security and the common defense.

(b) To establish a minimum level of production and consumption of Butyl rubber, until one of the butyl rubber plants has been sold to private industry.

(c) To exercise controls specifying the minimum proportions of general-purpose synthetic rubber which must be incorporated in such rubber products as he may designate, to the extent necessary to assure that total consumption of general-purpose synthetic rubber, including voluntary consumption, shall be not less than the minimum which he has established.

(d) To exercise similar specification controls with respect to Butyl rubber until disposal of the first Butyl rubber-producing facility.

(e) To impose such import restrictions on finished and semi-finished rubber products as he deems necessary to assure equality with like or similar products produced within the United States in accordance with specification controls applicable to domestic manufacture.

(f) To produce and sell synthetic rubber and its components to the extent necessary to meet the minimum security level of production and consumption and, to the extent practicable, additional quantities to meet demand above this level (provided, however, that there should be no obligation to produce these additional quantities), to provide technical service to consumers of synthetic rubber, and to do all things necessary in connection with and related to such production and sale.

4. The Government's research in synthetic rubber is now being carried on under contracts which expire with the Rubber Act of 1948, on June 30, 1950. It is recommended that the government's authority to conduct research in synthetic rubber continue. When the plants are privately owned, there should be a stimulus to research in manufacture and particularly in utilization of synthetic rubber on the part of these private interests, so that the Government's participation in research in these areas may be substantially reduced. On the other hand, because of the importance to national security of the development of new or improved synthetic rubbers which can completely replace natural rubber in essential military and civilian applications, it is believed that the Government should have authority to carry on a substantial program of research directed toward this objective.

5. The Government-owned evaluation laboratory at Akron provides valuable service to both private industry and the Government, and should be continued in operation by the Government. So long as the Government is actively engaged in the manufacture of synthetic rubber, the Akron research facilities should be continued on the present basis. Thereafter the authority should be continued to retain these facilities and use them primarily in connection with research conducted in rubber and related fields by the various military and civilian agencies of the Government.

6. It is recommended, therefore, that the President be given authority for disposal and that plants be offered as soon as possible.

7. It is recommended that disposal of any plant which the president has determined to be necessary to provide the capacity needed for national security shall be subject to a National Security Clause containing such requirements for maintenance of plant and equipment as the Government may determine to be necessary.

It is also recommended that, whenever mandatory usage requirements for general-purpose synthetic rubber are in effect, the Government be authorized to direct the sale to meet mandatory use requirements of a limited percentage of the capacity of each copolymer or butadiene plant sold or leased, and to direct the price and quality of the material thus sold.

8. It is further recommended that the following limitations be placed on disposal of synthetic rubber facilities.

A. GR-S plants (including feedstock facilities):

(1) Copolymer or butadiene plants should be sold or leased only when, in the judgment of the President, the disposal would be consistent with the development of effective competition.

(2) At least one copolymer plant should be sold or leased for the production of general-purpose synthetic rubber to a firm or firms determined by the President to be not dominant in the rubber products manufacturing industry, and not corporately connected with a dominant firm, before or simultaneously with the disposal of any copolymer plants to dominant firms.

(3) Not more than 75,000 long tons of copolymer plant design capacity should be sold or leased to any one firm for the production of general-purpose synthetic rubber until at least 250,000 long tons of design capacity have been sold or leased for the production of general-purpose synthetic rubber.

(4) No sale of both a butadiene and copolymer facility to a single concern should be permitted where such concern already controls one or both of the remaining two steps, in terms of vertical integration, in the ultimate production products from raw materials, except upon a finding by the President that such disposal would be consistent with the development of effective competition. [For this purpose, the four steps in such production are deemed to be (a) supply of feedstocks for butadiene or styrene, (b) production of butadiene or styrene, (c) production of general-purpose synthetic rubber, and (d) manufacture of rubber products.]

(5) Every effort should be made through special inducements to sell a maximum number of plants to non-dominant firms.

B. Butyl rubber plants:

(1) No more than one plant should be sold for the production of Butyl rubber to a firm which is determined by the President to be dominant in its industry or corporately connected with a dominant firm, except upon a finding by the President that other disposal is impractical and that disposal to a dominant firm is in the public interest.

Factual Data

The Steelman report of about 100 pages is divided into seven chapters as follows: Chapter I—The Framework of a National Rubber Policy; sections on The Strategic Position of Rubber, and, Basic National Objectives. Chapter II—Background of the Rubber Program; sections on Wartime Experience, and, Post World War II Experience. Chapter III—The Current Status of Synthetic and Natural Rubbers; sections on Technological Aspects of Rubber Materials, The Supply of Rubber, The Demand for Rubber, Cost of Production of Rubber, and, Competitive Status of Synthetic Rubber. Chapter IV—Synthetic Rubber Capacity, Active and Stand-By; sections on Total Synthetic Rubber Capacity, and, Active Synthetic Rubber Capacity. Chapter V—Research and Development. Chapter VI—Disposal of Plants in the Synthetic Rubber Program; sections on Criteria of a Disposal Program, Problems of Disposal, Advantages of Private Ownership, Advantages of Government Operation, Aspects Unaffected by Plant Ownership, Incentives and Deterrents to Purchase of Plants, Disposal Recommendations, and, Method of Disposal. Chapter VII—Duration of Legislation.

There are also four charts, nine tables, and four photographic illustrations included in the Steelman report. Certain of these data are new or recently revised and are therefore reproduced herewith for the record.

The report states that the estimates of both production of natural rubber and consumption of all rubbers are approximate and subject to error, both in the assumptions on which they are based and in the statistical estimating process. The imponderables involved in such estimating are considered too large to justify the determination of rubber policy solely on the basis of such calculations; however, the figures do indicate a possibility of a market for domestically produced GR-S and Butyl in the order of magnitude of 200,000 tons for several years immediately ahead, caused solely by a shortage of natural rubber, it was added.

As far as Butyl rubber is concerned, the report states that since the technical superiority of Butyl over natural rubber for inner tube production, its major wartime use, is established, the essentiality to national security of continuing research is materially reduced.

SCHEDULE OF PROFIT AND LOSS, GOVERNMENT GR-S OPERATIONS, FISCAL YEARS ENDING JUNE 30, 1948 AND 1949

(¢ a Pound)

Item	1948	1949
Sales and other income*	18.6	18.6
Operating costs and expenses:		
Cost of goods sold†	13.6	13.8
Research and development‡	.4	.5
Unrecovered sales freight and storage and handling§	.2	.4
Administrative expense¶	.2	.2
Miscellaneous expense¶	.1	--
Depreciation of operating plants and facilities**	3.0	3.2
Interest on funds invested in operating assets††	.4	.4
Total	17.9	18.5
Net profit	.7	.1
Sales volume (thousand long tons)	366	324

* Income from sources other than sale of rubber is minor.

† Includes raw materials, salaries, wages, chemicals, utilities, and other similar expenses incurred in the operations of the manufacturing plants.

‡ Includes all expenditures for research and development, most of which is conducted under contract by universities and research and industrial organizations.

§ Includes the loss which results from the charge of a uniform freight rate on all rubber shipments, which is less than the actual shipping costs incurred in the delivery of goods to the consumer, and the outlay for private warehouse accommodations used for storage of government inventories of synthetic rubber.

¶ Primarily Office of Rubber Reserve Washington office expense.

‖ Includes losses from fire and accidents, loss on property disposals, contract termination expense, and other expenses.

** Based on an average depreciation rate on operating facilities which approaches 10% per annum.

†† Based on interest at 1⅞% per annum.

WORLD PRODUCTION OF NATURAL RUBBER, CONSUMPTION OF NEW RUBBER, ACTUAL AND ESTIMATED DEFICITS, 1947-1953

Natural Rubber Production (1,000 long tons)	1940	Potential Capacity	1947	1948	1949	1950	1951	1952	1953
Malaya	547	750	646	698	675				
Indonesia	543	900	278	432	425				
Ceylon	90	95	89	95	90				
Thailand	44	95	52	95	95				
Indo-China	64	85	38	44	40				
Other Asia	85	110	82	90	90				
Africa	16	60	38	42	43				
Tropic America	26	30	35	24	22				
TOTAL	1,415	2,125	1,258	1,520	1,480	*1,675	*1,750	*1,800	*1,850
Consumption (Total new rubber)	1,152	....	1,735	1,900	*1,875	*1,935	*2,000	*2,075	*2,150
Deficit			−477	−380	−395	−260	−250	−275	−300

*Estimated.

†Taken from "Rubber Statistical Bulletin" to complete comparison.—EDITOR

NOTE: The above table is actually a combination of Table 1 on page 32 and an unindentified table on page 49 of the Steelman report which have been combined so as to get all the data together in one place.

SCHEDULE OF PROFIT AND LOSS, GOVERNMENT BUTYL OPERATIONS, FISCAL YEARS ENDING JUNE 30, 1948 AND 1949

(¢ a Pound)

Item	1948	1949
Sales and other income*	18.5	18.5
Operating costs and expenses:		
Cost of goods sold†	15.0	14.1
Unrecovered sales freight and storage and handling‡	.4	.3
Administrative expense§	.2	.2
Miscellaneous expense¶	.1	.4
Depreciation of operating plants and facilities‖	3.0	3.4
Interest on funds invested in operating assets**	.4	.4
Total	19.1	18.8
Net loss	−0.6	−0.3
Sales volume (thousand long tons)	58	54

N. B.: The footnote explanations are the same as those for the GR-S table preceding.

The GR-S industry, however, has not reached a position where it is safe to assume that it would continue to operate without government support at a level adequate for national security. In addition, further research is required to develop more satisfactory types of general-purpose rubber. It is necessary to determine at what rate the industry must operate to achieve continuing research and the required degree of rapid expandibility in an emergency, and the degree of government support required to achieve it, according to Mr. Steelman's report.

In the ensuing discussion a production and use of 300,000 long tons of synthetic rubber a year is indicated as a desirable figure, but 200,000 tons a year would "make a significant contribution" to fully effective stimulus to research, it was said.

In connection with the two tables on operating costs for GR-S and Butyl rubber, two charts are found which show the variation in cost of butadiene and cost of converting butadiene and styrene to GR-S with production rate as per cent. of effective capacity. For butadiene for a production rate between 50 and 100% of effective capacity the range of cost in cents per pound is 10.25 to 7.9. For conversion to GR-S for a production rate between 50 and 100%, the range in cents per pound is 5.5 to 4.4.

Comments from Washington

Our Washington correspondent reports that the administration's recommendations for new rubber legislation will receive formal consideration by Congress early in February. A special seven-man House Armed Services subcommittee, appointed January 17 and headed by Carl Vinson of Georgia, will commence public hearings as soon as the full committee disposes of proposals to extend the Selective Service system. Other members of this House subcommittee are Democrats Philip J. Philbin of Massachusetts, F. Edward Hebert, of Louisiana, and O. C. Fisher of Texas, and Republicans Dewey Short of Missouri, W. Sterling Cole of New York, and Mr. Shafer.

In the Senate, plans for handling rubber legislation had not been decided upon by January 23. The Senate Armed Services Committee, headed by Senator Millard Tydings of Maryland, received the administration's recommendations January 17. The expectation is that a subcommittee will be appointed soon with Senator Lyndon Johnson, Democrat, of Texas, as chairman.

The significance of referral of the President's recommendations to the Senate Armed Services, instead of the Banking and Currency Committee, was not lost on those in Washington and presumably elsewhere intimately concerned with what kind of rubber program the nation will have after June 30. The significance lies in the personnel of the two committees. As a member of the House Armed Services subcommittee, which conducted hearings on rubber legislation in the 80th Congress before his election to the Senate, Mr. Johnson was a vocal and constant critic of tire industry witnesses. He stressed even more than the Republican chief of that group—Shafer of Michigan—the importance of a strongly protected government synthetic rubber industry to national security.

The Rubber Act of 1948 which finally emerged as the present law was, in essence, a compromise of the strong pro-control views of Johnson, and to a lesser extent, of Shafer, and those of the major tire companies, reflected in the Senate by Senator John Bricker, Republican, of Ohio, who headed the Banking group's subcommittee which drafted rubber legislation.

Although only Mr. Shafer has spoken up at this time on the President's new proposals, Congress is not expected to decide on a new rubber law on party lines. It is a safe guess, however, that the dominant note in the Senate will be more pro-control with Senator Johnson in the saddle than had the Banking committee, with Senator Bricker alone of its membership keenly interested in rubber legislation, been given the job of drafting new rubber legislation.

Much may depend, when a committee bill reaches the Senate floor, on the attitude of Senator Robert Taft, Republican, of Ohio. During the British-Canadian-U. S. "dollar talks" in Washington in September, Senator Taft made a strong speech against easing R-1 controls to permit the use of more natural rubber in tires. His position at that time was even more pro-control than the Administration's.

Representative Shafer, after reading the President's recommendations and the Steelman report, declared that they "ask too much for too long." He then put forth his own program, which he said he would recommend as a basis for action by the Armed Services subcommittee, of which he is a member.

Highlights of his proposals follow:

(1) Three-year legislation, expiring June 30, 1953, granting the President authority to invoke specification controls to assume consumption of 150,000 long tons of GR-S a year. This authority could be used only when industry fails to consume this amount voluntarily.

(2) Three-year authority to the President authorizing government production of no more than 150,000 tons of GR-S annually. For the first year, only, the President would be authorized to produce up to 200,000 tons to "prevent a serious dislocation in business."

(3) Authority to offer all government rubber producing facilities for sale immediately. The President would be required to make a progress report on disposal by June 30, 1951.

(4) Removal of all controls on Butyl, effective July 1, 1950. No authority to continue such controls.

Other powers authorized by the Rubber Act of 1948, except patent pooling arrangements recently terminated by the President pursuant to the Act's direction, would be continued for three years.

The administrative agencies which took the principal role in framing the Steelman report are not expected to hold a unified front if, as expected, the recommendations to continue usage controls run into heavy fire from Congress.

With the transmittal of the recommendations and report to Congress, the Rubber Division, Commerce Department, placed in the mail a concise, factual summary of the Steelman recommendations to all members of the rubber industry.

Additional Year-End Statements

In addition to the year-end statements of certain rubber industry executives published last month, further material of this sort has been received, including a statement by the Rubber Association of Canada.

William O'Neil, president of The General Tire & Rubber Co., foresees an increased replacement tire sale demand not only for 1950, but for 1951 and 1952.

"There will be a great increase of older cars on the highways in 1950," the General Tire president explained. "During the first two years a car or truck generally will not be in the market for replacement tires, but more and more people will put new tires on their cars—and drive them another year or two."

Truck mileage continues to mount, and a much greater tire demand from truckers than at any other time in history was predicted.

"More freight was moved by trucks in 1949 than the previous year, and the new year will see another record set," said Mr. O'Neil. "Freight movement by truck has become truly efficient and economical, meeting the tremendous demands of America's expanding population. The trucking industry really is an important factor today in America's economy."

The General Tire president also expects a big demand for the other products of the industry. He pointed especially to the mechanical goods field.

"The tremendous year Detroit is forecasting can mean only a busy year for our factories," he said. "Our best information indicates a total consumption of more than a million tons of rubber in 1950—and the industry to consume that amount of natural and synthetic rubber must have plenty of orders. The Detroit motor vehicle output most likely will come close to the 5½ million mark—and that means work for the rubber industry's workers."

Predicting that the new year will bring out many of the products of the rubber industry's expansive research activities, Mr. O'Neil added: "We are reaching daily into new fields with remarkable results. We have only just begun to merchandise the things developed by our chemists—and Akron has the second greatest number of chemists of any city in the world. In the plastics field alone, there is unlimited opportunity for the rubber industry. After all, rubber itself is a plastic—and the increase in plastics is naturally coming to the rubber industry."

In concluding, Mr. O'Neil said: "As long as people will burn gasoline in their trucks and automobiles to give us this outlook in the rubber business, the general business picture for the nation in 1950—and for several years—must be a bright one. The oil, steel, automobile, and rubber industries form a mighty bulwark in the nation's economy—and it follows that if their outlook is bright, then things generally in the nation will be all right."

W. S. Richardson, president of the B. F. Goodrich Chemical Co., also said that factors are at hand which indicate that 1950 should be a good business year. At present our manufacturing plants are operating at a high rate of output, and there is reason to believe that this rate will continue for the next several months. However, because of the very substantial increases in productive capacity that have been made in the United States since the end of the war, we are certain the coming year will be characterized by intense competition in which technological improvements, new products, and aggressive selling effort will be essential and important factors in the quest for markets.

Significant developments during the past year in the plastics phase of our business have broadened the fields for Geon polyvinyl raw materials, Mr. Richardson declared. Perhaps the most important is the concept that polyvinyl chloride film has merit as a new textile material. Secondly is the rapid expansion that has been

brought about by the introduction of polyvinyl plastisols, which reduces markedly the capital cost of going into the business of producing end-products from these materials.

We have come to regard research and development—separate but yet interdependent functions—as prime items in costs which must be given equal attention from management in forward planning along with prime production and distribution costs. For sound corporate planning today it is necessary that research be objective, productive, and completely integrated into corporate thinking, it was pointed out. Costs of research and development are sound insurance for the future of business, and to slight this phase of operations in any way could prove as disastrous as failure to keep equipment modernized.

On the subject of prices, there is little likelihood that Goodrich Chemical materials will be lowered in price in the near future: in fact, quite the reverse is indicated by upward pressures on costs that are occurring in several directions.

We are hopeful that economies in government will be brought about and that the pressure of taxes will not prove to be deterrent to expanding business. At present there is a resurgence of opinion expressed in government circles in late 1948 that corporate profit taxes should be increased. Proponents of this theory should be well aware that increasing the corporate tax burden is in effect decreasing the funds available for further investment and expansion in industrial enterprises. It necessarily follows from this point that accruing benefits offered by corporations in the form of better products at lower costs and more and better jobs would be jeopardized.

In conclusion, Mr. Richardson said that only through constant and diligent improvement of our products will American industry be able to maintain the high standards of quality and service that have featured its unsurpassed record of achievement. If business is allowed to progress, unfettered from harmful restrictions, 1950 may well prove a most significant year in our industrial history.

The Goodyear Tire & Rubber Co., as a result of a survey of potential tire replacement sales taken in 48 states, stated that sales of replacement tires in 1950 should run about 15% higher than in 1949.

While the survey showed that the old standby in conventional sizes—6.00 by 16—was still the most popular, it has declined from its 1948 position when it constituted two-thirds of all passenger tires on the highway to about one-half the passenger-car tires in service. The number of low-pressure tires in operation in 1949 was found to be three times greater than in 1948.

Not taken into consideration was the fact that car registration last year is approximately 19% ahead of 1948, making the potential sales replacement picture even brighter. The public also prefers best-quality tires, the report reveals, since some 80% of tires observed were so-called first-line tires.

G. M. Sprowls, manager of Goodyear's highway transportation department and responsible for the survey, says particular pains were taken to obtain a good cross-section of the country. The report is reliable, he believes, because it is entirely factual. Unlike some polls, results did not depend upon individual opinions, but upon actual observations.

Outlook for the rubber industry in Canada in 1950 were surveyed by G. B. Smith, manager and secretary of the Rubber Association of Canada. On the whole the recent currency devaluations will probably deal a further blow to the rubber industry's important, but fast disappearing export trade, it was said.

Dumping of rubber products from Czechoslovakia, Hong Kong, and Japan at prices sometimes below Canadian costs for raw materials alone, threatens to become a major problem to several branches of the industry in that country, unless the government takes action against this unfair competition before serious injury to Canadian industry and employment has actually occurred.

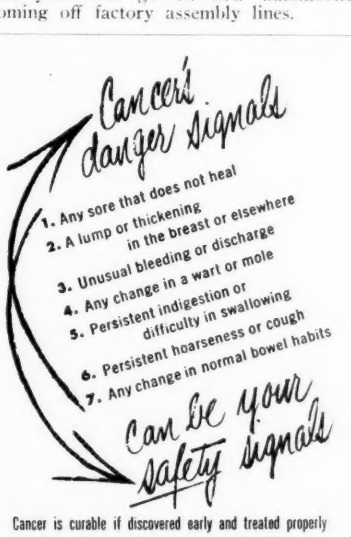
Devaluation has increased not only costs of materials and equipment necessarily imported from the United States, but also paradoxically the cost of natural rubber imported from Malaya, the Canadian Association said. Higher freight rates and wages will contribute to create a cost problem which will probably be aggravated by a further slight decrease in volume.

In spite of all these unfavorable factors, the products of the industry serve basic needs of life and work in Canada, and this fact insures the industry as a whole a reasonably satisfactory volume with the present prosperous outlook for Canada in 1950, it was concluded.

Original Equipment Tire Prices Raised

The price of original equipment tires to manufacturers of automobiles and trucks was increased a minimum of 5% by most tire manufacturing companies. Goodyear in announcing its price increase on December 28 stated that increased costs of labor and materials over the last 12 months have not been reflected in prices to manufacturers of new cars and trucks, and this burden together with the recent increase in freight rates, has now made the advance in original equipment tire prices imperative.

Prices of original equipment tires sold to automotive manufacturers are generally regarded as restricted trade information. A 5% increase in price for a 6.70 by 15 tire might be estimated, however, as amounting to about $10 or $12 for the five tires and tubes supplied as equipment on most popular makes of passenger cars. About 25 million of the 66 million passenger-car tires that will probably be made this year will go on new automobiles coming off factory assembly lines.


Cancer's danger signals
1. Any sore that does not heal
2. A lump or thickening in the breast or elsewhere
3. Unusual bleeding or discharge
4. Any change in a wart or mole
5. Persistent indigestion or difficulty in swallowing
6. Persistent hoarseness or cough
7. Any change in normal bowel habits
can be your safety signals
Cancer is curable if discovered early and treated properly

AMERICAN CANCER SOCIETY, INC.

Companies Seek Injunction in FTC Case

The Big Four rubber companies and Montgomery Ward & Co., in connection with the Federal Trade Commission's proposed rule limiting discounts on quantity sales of tires, filed injunctions during January to restrain the FTC from holding hearings on the rule since they believe the hearings deny them their constitutional rights in that they will not be allowed to examine evidence in the case or cross-examine opposition witnesses.

In a public statement the United States Rubber Co., stated that it and other rubber companies were opposed to the proposed new discount regulation as it would lead to an artificial and inefficient system of tire distribution and deprive the public of advantages which have developed out of the free market in tires. A more complete hearing than the present procedural rules allow was asked for.

The Federal court in Washington, D. C., on January 18, however, denied the request for injunction and threw the rubber company cases out of court. Filing of briefs, as scheduled on January 17, was therefore done as required, and oral hearings are to commence on February 7. The Commission heard in writing from 35 companies and organizations, some filing brief telegrams and some voluminous economic and legal briefs. Two economic studies, tracing the history of tire selling from its infancy to the present day, were included.

Eleven tire manufacturers, including the Big Four, large distributers, such as Montgomery Ward and Western Auto Supply, and large farm cooperatives came out squarely against the discount proposal of the FTC.

The director of marketing research for Firestone Tire & Rubber Co., T. G. MacGowan, declared that "no quantity limit rule—however carefully drawn—can properly have a place in the tire business." Generally, opponents asked the Commission to drop the whole idea of limiting tire discounts.

The 13 written statements in favor of the proposal came primarily from small independent dealers. The National Association of Independent Tire Dealers put forth a detailed proposal which it said was even tighter than the Commission's.

The core of the controversy appeared to be whether a quantity discount limit would actually give the small buyer a better break. The independent tire dealers said "yes." The tire manufacturers warned of "chaos" in the industry if the proposal is adopted. They said consumers would have to pay more for tires and that development of better tires would be retarded.

Seiberling Rubber Co. warned that adoption of the proposal would invite even greater vertical integration—with more manufacturers setting up their own stores and big chain-stores going into manufacturing of tires. This practice would drive even more independents out of business, it was said.

The big distributers, including the farm cooperatives and their parent organizations, the National Grange and American Farm Bureau Federation, were concerned that the proposal, if put into effect, would deprive them of cost savings in buying tires for their members.

Firestone's attorney, Edward F. Howrey, wrote: "There now exists a healthy competitive balance between all factors in the tire industry. The public has been well served; the dealers have not been injured; there has been competition in price, on product, and in selling activity; prices have

been lowered, and employment maintained at high wages. Free competition in all its vigor has dominated the industry.

"Imposition of a carload quantity limit is unnecessary and would create more evils than it could possibly cure. It would increase consumer prices. It would injure tire dealers who handle the bulk of the replacement business. It would impede scientific research and retard tire development. It would put a premium on inefficient distribution.

"According to some economists and marketing experts, the salvation of the private enterprise system may well depend upon getting merchandise into the hands of the consumer at lower prices. The imposition of a government-dictated quantity limit would strike in the opposite direction."

Goodyear said the limit "would cause irreparable and permanent injury" which could not be rectified by abandoning the limit once it had been put into effect.

Natural Rubber Bureau Program

The Natural Rubber Bureau, Washington, D. C., announced on January 18 the opening of a major advertising campaign in support of natural rubber. The first advertisements are appearing in ten national magazines and in 96 daily newspapers throughout the country.

Backed by the rubber growers of Malaya, Ceylon, and French Indo-China, acting through the British Rubber Development Board, of London, the advertising series is part of an overall promotion program to focus U. S. attention on natural rubber and its importance in world economy, it was explained.

Natural rubber is the greatest dollar-earner in the sterling countries, and the natural rubber producers are seeking to build good will for the industry and to open the way for new and increased usage of natural rubber in this country. Chief among the new developments to be publicized are natural rubber in roads and in latex foam cushioning.

What the Natural Rubber Bureau seeks is market expansion, not restriction; fair competition, not "warfare"; self-help, not subsidy, it was said.

Director of the Bureau is Warren S. Lockwood, and associate director is Howard C. Bugbee, former editors of *Lockwood's Rubber Report*. This publication has now been replaced by the *Natural Rubber News*, which will appear at approximately monthly intervals; the first issue was distributed in January.

Litchfield on Rubber Roads

P. W. Litchfield, chairman of the Goodyear board, stated early in January that thousands of miles of American highways, as well as playgrounds, tennis courts, and other recreation spots, will be surfaced with rubber in the next decade. He made this forecast early in January, following an inspection in Akron, O., of a section of rubber highway installed at his direction 25 years ago, and several stretches of rubber surfaced thoroughfares and school recreation yards put down in the Akron area by his company since the war.

The 25-year-old road, consisting of natural rubber blocks, has withstood the pounding of millions of cars and heavy trucks and shows little or no deterioration; however, the solid rubber block roadway was found to be too expensive, and the idea did not progress.

The postwar surfacing jobs, using both natural and synthetic rubbers in various forms in mixture with asphalt, are being watched closely by paving construction men and to date have brought forth commendable performance reports. During the next 10 years a yearly average of 650,000 miles of highways will be newly constructed or resurfaced; a 5% mixture of rubber with the conventional asphalt mix, applied at an average thickness of an inch and a half on a 24-foot highway would add about $1,000 per mile to the installation cost and would save millions of dollars in highway and vehicle maintenance costs, it was estimated.

Mr. Litchfield pointed out also that the successful use of synthetic rubber, as well as natural rubber, could well serve as a cost-bearing means of keeping the government's synthetic plants in continued operation.

"With such expanding markets for rubber as this development suggests," he said, "there is the prospect that we can keep our own vital synthetic plants in active operation and at the same time absorb the increasing output of the natural rubber plantations which are now experiencing a rapid rate of postwar rehabilitation."

Industry Trends

In his report to stockholders Harvey S. Firestone, Jr., chairman of the Firestone board, on January 14, pointed out that the year 1949 was a period of readjustment in the rubber industry. It marked the end of the seller's market and the return to the buyer's market, which is the normal market under our American system of competitive free enterprise, he added.

Tire price reduction of early 1949 together with the economic readjustment and the reduction in accumulated demand affected both the sales volume and profits of the Firestone company in 1949; total sales for the year amounted to $579,606,107, as compared with $635,858,424 for the previous year.

In commenting on world production and consumption of rubber, Mr. Firestone said that improved types of synthetic rubber, particularly that made by a low-temperature process developed in the United States, resulted in increased usage. Outstanding development of the year by Firestone was a synthetic rubber that will maintain its resiliency at temperatures as low as 75 degrees below zero.

The 6.00 by 16-size tire made by Firestone is providing 25% more mileage than a similar tire made in 1945. By using cold-process rubber in combination with new carbon blacks, the synthetic rubber tread will outwear natural rubber, it was said.

Firestone is manufacturing 75 and 57 millimeter recoilless rifles, rubberized radomes for protecting radar equipment, self-sealing fuel cells, and a new-type shock-resistant, weatherproof container for jet engines for the armed forces.

The Firestone Plastics Co. increased its production of Velon films and filaments and improved its position in the luggage and upholstery fields, it was reported. With increased capacity, the company is now in a position to supply basic resins to other plastics manufacturers.

Reference was again made to the fiftieth anniversary of the Firestone company, which occurs in 1950. In those 50 years the Company has grown from a small, abandoned foundry building with a working force of 12 men to a worldwide organization of more than 70,000 people whose high-quality products are known and respected everywhere, Mr. Firestone said.

Manufacturers' shipments of passenger-car tires declined seasonally in November to 4,371,069 units from 5,784,685 in October. The Rubber Manufacturers Association, Inc., revealed in its regular monthly report on January 17. Although this reduction was slightly more than 24% from the previous month, the Association called attention to the fact that for the first 11 months of 1949, shipments of passenger-car tires amounted to 60,809,205 units, slightly higher than the 59,220,964 units shipped in the comparable period of 1948.

Production of passenger-car tires was 8.6% less in November to 5,135,411 units, from 5,621,182 in October.

Shipments of truck and bus tires were also off sharply in November to 896,345 units, compared with 1,054,919 units in the previous month. Production of truck and bus tires, however, was up almost 3% in the month; output reached 904,388, against 878,835 in October. For the first 11 months of 1949, shipments of truck and bus tires totaled 10,498,853 units, considerably lower than the 1948 total for the same period of 13,119,267.

Automotive tubes followed the same trend as the tires, with shipments down 24.1% to 4,216,419 units from 5,557,104 in the previous month, and production down 2.7% to 5,154,605 units from 5,295,630 in October.

United States exports of rubber and rubber products declined in value from $8,218,371 in October, 1949, to $7,109,904 in November, the lowest figure since November, 1948, when shipping difficulties held exports to $6,833,113, the United States Department of Commerce reported on January 12.

Compared with those of recent months, November, 1949, exports in many product categories were not at particularly low levels, according to an analysis of Bureau of Census data by the Office of Domestic Commerce. The chief decline was in transportation goods. Exports of off-the-road tires, truck and bus tires, and automotive inner tubes were the lowest of the year, and shipments of other tires, tubes, camelback, and tire repair materials were at lower levels than usual. Exports of truck and bus tires were the lowest since February, 1946.

Value of rubber exports in the first 11 months of 1949 was $105,707,715, a decline of 11.2% from the $119,104,323 reported for the corresponding period of 1948.

Compared with January-November, 1948, figures, exports during January-November, 1949, have, on the whole, held up well; the sharpest downturns occurred in belting, hose and packing, footwear, soles and heels, and passenger-car tires. The decline of $2,270,004 in exports of truck and bus tires, actually represented a decline of only 5%.

The RMA estimate of rubber consumption for December gave a figure of 84,381 long tons for that month, as compared with the revised figure for November of 83,074 tons. Of this total new rubber consumed in December, 52,866 long tons was natural rubber, and 31,515 long tons was synthetic rubber. Revised figures for November consumption of these two types were 51,785 and 31,289 tons, respectively.

The RMA estimate of total rubber consumption for 1949 becomes, therefore, 988,618 long tons total new rubber, 576,461 long tons of natural rubber, and 412,157 long tons of synthetic rubber used.

Labor News

Negotiations between Goodyear and the United Rubber Workers, CIO, were resumed January 10 on pension and insurance plans. The working conditions part of the company-wide contract with the union

To Help Close "The Dollar Gap"

NATURAL RUBBER GROWERS SET UP BUREAU TO EXPAND U. S. MARKET

Every leading American statesman and economist — including in recent weeks President Truman, Secretary of State Acheson, and "Marshall Plan" Administrator Hoffman — have been urging overseas countries to sell more goods to the U. S.

They point out that Marshall Aid cannot go on forever, that the present un-balance of trade between the U. S. and other countries leads to economic chaos, and that it is undesirable to achieve a balance of trade by cutting down on U. S. exports.

Only One Answer

So they *all* come to the *same* conclusion — that the only answer is for the U. S. to IMPORT MORE GOODS!

And — they ALL AGREE that the real answer is for industries in other countries to do a better *SELLING JOB* in the U. S. — to study U. S. markets, to advertise, to merchandise their products.

And it is for just such purposes that the leading dollar-earner of all the industries in the sterling area — the rubber producer — has set up the Natural Rubber Bureau in the U. S.

To Promote New Uses

The British Rubber Development Board, representing these rubber growers of Southeast Asia, has established the Natural Rubber Bureau in Washington, D. C. to promote new uses for natural rubber in the U. S. A.

Natural rubber alone earned nearly as many dollars for the sterling area last year as did all of Britain's manufactured goods.

And this was in spite of the fact that natural rubber was selling to American rubber manufacturers this past year at *less than pre-war* prices — while every other major agricultural product in the world was selling at *two or three times* pre-war costs.

And the natural rubber producers are going about expanding their market in the American way — by market research, by advertising, by promoting their product.

They are trying to sell more in the U. S., to earn more dollars to close the gap, to make Marshall Aid less needed, to make it possible for other countries to buy more U. S. goods, and to achieve a stability and prosperity among free nations.

REAL RUBBER FACTS

Natural rubber is the No. 1 dollar-earner for sterling countries.

* * *

In 1949, the United States imported about 600,000 tons of natural rubber from Southeast Asia.

* * *

Natural rubber is now selling *below* pre-war prices. Its production and price are unrestricted and unsubsidized.

Natural rubber is the key to the prosperity of Southeast Asia — including over 400,000 independent rubber farmers in Malaya alone.

* * *

In addition to being the chief ingredient for tires, natural rubber has a growing market in latex foam cushioning and a great potential market in rubber roads.

Full page advertisements will appear in leading national consumer magazines to promote such new uses for natural rubber as rubber roads, latex foam cushioning, etc.

Natural Rubber Bureau

1631 K St., N. W., Washington 6, D. C.

Natural Rubber

Nature and Science Serving Mankind

This booklet, "Stretching Highway Dollars With Rubber Roads," is being offered in current consumer advertising. Write for your free copy today to Dept. C9, NATURAL RUBBER BUREAU, 1631 K St., N.W., Washington 6, D. C.

terminates on February 10, and negotiations on working conditions will therefore also have to be included in these continuing talks. No information as to the progress of the pension plan talks was available late in January, and it is not considered likely that decision on a new contract will be reached at an early date. Meanwhile the Akron Goodyear local union authorized a strike vote to be taken when and if necessary, to aid their leaders in the bargaining with the company.

The resumption of negotiations between the Firestone company and the URWA took place on January 25. Here, also, no immediate decision seemed likely since the working conditions part of this company's contract with the union also expires on March 1, and both pension plans and working conditions are now involved. The Akron local Firestone union also authorized a strike vote to be taken when and if necessary.

U. S. Rubber and General Tire are expected to resume their talks with the URWA in February, and many other companies have been resuming or are about to resume negotiations with the union on the subject of pension and insurance plans. Progress of these negotiations has been exceedingly slow, however, and the union is in a peculiar position of reaching the time of the year when new demands are usually made on the companies, but no decision has been reached on the demands made a year ago.

Buckmaster on Labor's Future

L. S. Buckmaster, president of the URWA international union, in an article in the *Akron Beacon Journal* for December 26 stated that for many years the chief purpose of organized labor was to organize the unorganized and to bring the basic benefits of collective bargaining to its members. Organized labor has now become a national institution and in order to serve its members better will have to take careful account of the social, political, and economic winds.

In economic affairs, the measure to which we as a nation are able to maintain a high and continous level of prosperity is certainly one of the major conditions to which we will orient our actions. We are aiming for a reduction in the fluctuations of our economy which engender fear in the hearts of our people, Mr. Buckmaster said.

If American business continues to insist that the best way to adjust our economic affairs is by return to practices which did not work or which caused suffering and hardship on the part of the American worker, then we in American labor will chart our course for strong regulation of those evils which we are trying to prevent, Mr. Buckmaster warned. On the other hand, should American business take an enlightened approach and endeavor to work out adequate protection for our people with fair and unselfish methods to sustain high employment and production with just compensation, our approach also will be one of cooperation with fewer controls, he added.

The decisions of the government in taxes and foreign trade are among other signs by which we in labor will chart our course, Mr. Buckmaster continued.

In connection with the Taft-Hartly Act, it was said that the union's political programs will, however, not be based on any one law. The whole political climate and the extent to which unions are able to feel secure as an institution to express freely and work for the welfare of members will be their guides.

The collective bargaining process is one of the best ways of achieving necessary social and economic improvements for the welfare of the working people, the union president said. It is through collective bargaining that the needs and the wishes of the working people are brought to the direct attention of management.

The bargaining table can be one of the bulwarks of freedom in our nation, but if management regards collective bargaining as something distasteful and the needs of the workers as something which they would rather not bother with, then the unions will be forced to achieve social and economic objectives through legislation, Mr. Buckmaster added.

Other URWA Activities

The opposition faction of the URWA in an article in the December issue of the union's publication charged that President Buckmaster violated union "law" in using the columns of the publication to criticize certain union members. The article referred to Mr. Buckmaster's comments following previous criticism he had received for discharging the URWA director in Canada, Joseph MacKenzie and three members of his staff for "unsatistactory service."

In Canada, however, the local union at the Goodyear Tire & Rubber Co. of Canada plant, in New Toronto, passed a motion expressing confidence in the international president. This union had just signed a new contract with the company in which it was granted a 7¢-an-hour wage increase, retroactive to January 1. Besides the wage increase, the contract reduces from 20 to 15 the number of years required to obtain a paid vacation of three weeks each year and increases from seven to eight the number of other paid holidays.

At the annual convention of the CIO council in Cincinnati, O., in January, the URWA urged the parent union to support the 210-million-dollar "belt railroad" proposed by H. B. Stewart, president of the Akron, Canton & Youngstown Railroad, last year, which received a setback in the Ohio legislature when that body refused to grant the Riverlake Belt Conveyor Lines, Inc., common carrier rights.

"This form of transportation is clearly feasible and in the public interest," the rubber union stated in a resolution and added, "the personnel to operate and maintain the belt line will equal the number employed by other transportation systems."

Mr. Stewart will attempt to get approval from the Ohio legislature again this year. His efforts last year were defeated by the combined action of the railroad brotherhoods and the railroad companies, but this year the rubber, steel, and auto workers unions may support the project more aggressively.

"Hi-Sil" Price Reduced

W. I. Galliher, executive sales manager of the Columbia Chemical Division of Pittsburgh Plate Glass Co., has announced, effective February 1, 1950, that Columbia will sell its new fine particle silica pigment "Hi-Sil" at the following prices, which will apply to all domestic contract and spot sales: carloads or 10-ton truckloads 11¢ a pound; less than carload 12¢ a pound, packed in 25-pound multi-wall paper bags f.o.b. Columbia Chemical Division plant, Barberton, O. Terms net 30 days. This reduction in price is made possible by increased production resulting from the excellent acceptance of "Hi-Sil" by the rubber industry.

EAST

Jeter Succeeds Avery

Raphael G. Jeter, general counsel of The B. F. Goodrich Co., Akron, O., has been elected secretary and general counsel of the company, succeeding Willis F. Avery, who retired December 31 after more than 25 years with Goodrich. Mr. Jeter joined the company in 1948 after a successful law career. He is a native of Arkansas, but has lived in Akron since early childhood and attended local public schools, Akron University, and Ohio State University.

Mr. Avery came to Goodrich in 1924 after five years in the United States Patent Office and four years on the legal staff of the Westinghouse Electric & Mfg. Co. He was named assistant secretary of Goodrich in 1936 and secretary in 1944. He is a native of New Hampshire and was educated at Brown University, the University of Maine, and the Washington, D. C., College of Law.

Carl G. Horst has been appointed manager of retail merchandising of Goodrich's replacement tire sales division and has been succeeded as manager of retail credit sales by William B. Flora. Mr. Horst, who succeeds Robert L. Reeves, resigned, has been with the company nearly 22 years and had held his previous post for the last three.

Mr. Flora, with Goodrich since 1936 in the associated lines sales division, for the last several years has been field manager of the division's budget sales.

James J. Newman, Goodrich vice president, recently was elected treasurer of the National Committee for the Repeal of Wartime Excise Taxes, 60 E. 42nd St., New York, N. Y.

Safety Campaign for Young Drivers

A new campaign to promote good driving practices among drivers under 25 years of age was inaugurated January 5 on the "Father Knows Best" radio program starring Robert Young. Mr. Young, who has a strong personal interest in highway safety, devoted his entire January 5 broadcast to the Inter-Industry's Highway Safety Committee's Good Drivers Agreement campaign and will feature the campaign on future programs. According to James J. Newman, Goodrich vice president and chairman of the Committee, the nation's young drivers will be asked to join the "Man-to-Man" and "Dad-to-Daughter" Good Drivers Clubs by signing agreements on eight good driving practices which they pledge to observe while using the family car. Parents and teen-agers will be able to obtain copies of the agreements and club cards by writing Robert Young, "Good Drivers Club," care of their local NBC radio station.

Department of Defense, Washington 25, D. C., recently announced the awarding of the following contracts: Norton Co., Worcester, Mass., grinding machine, $218,555; Chicago Show Printing Co., Chicago, Ill, 20,000 rolls of adhesive tape, $100,200; Armstrong Rubber Co., West Haven, Conn., tires and tubes, $547,260.82; The Mohawk Rubber Co., tires and tubes, $228,888; General Tire & Rubber Co., Jato Division, Azusa, Calif., jet assist take-off units, $440,000.

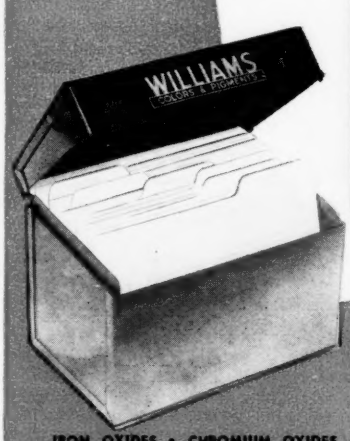
RUBBER COMPANY SOLVES AGING PROBLEM THROUGH *proper color formulation*

A rubber company, manufacturing a brown rubber coated fabric, bumped into serious trouble when it was discovered that the finish aged badly on storage.

Color research experts of C. K. Williams went to work on the problem, found that the coating had been pigmented with a brown color not suited for this specific purpose.

The pigment used had been selected for color match only . . . no consideration had been given to chemical composition.

The Williams laboratory recommended a new combination of iron oxide pigments, low in manganese content, which produced the desired color . . . at the same time eliminated all aging difficulties.



IRON OXIDES • CHROMIUM OXIDES
EXTENDER PIGMENTS

LET WILLIAMS PUT THE MICROSCOPE ON *Your* COLOR PROBLEM

Whatever your color problem, bring it to Williams. As shown by this case history—and many similar histories in our files—Williams can often save you time, money and headaches on proper color formulation.

For detailed information, address Dept. 9, C. K. Williams & Co., Easton, Pa.

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EAST ST. LOUIS, ILL. EASTON, PENNA. EMERYVILLE, CAL.

France Attracts Dewey & Almy

Plans for opening a plant in France to manufacture can-sealing compounds and other products were announced January 4 by Hugh S. Ferguson, executive vice president, Dewey & Almy Chemical Co., Cambridge, Mass.

Conditions in France have improved to such an extent, said Mr. Ferguson, that the company believes sales to France and its colonies can be doubled, adding that such has been the case in England where sales have been trebled since manufacturing began in London in 1940.

The plant will be located in Epernon, in the vicinity of Paris, with Henry Wasmer, Dewey & Almy's managing director in London, supervising operations, which are expected to begin next summer.

A subsidiary company, Darex S. A. R. L., has been formed to operate the plant. Dewey & Almy receives 51% of the stock, principally in return for the contribution of manufacturing "know-how," formulae, and business already developed in France, explained Mr. Ferguson. G. E. Marin, French banker, is president of the subsidiary.

Mr. Ferguson further said that the formation of the new company has been approved by the French government, which recently announced regulations permitting conversion into dollars and transfer to the parent U. S. company of dividends declared in francs.

In addition to sealing compounds for the French canning industry, the plant will manufacture fluxes used in soldering of cans, radiators, and other objects; as well as products for improving the quality of concrete in construction work.

Mr. Ferguson also declared that rebuilding of the company's Naples plant, damaged during World War II, has been completed and that it is now in operation manufacturing can-sealing compounds and other products.

Besides the Naples and London plants, Dewey & Almy has manufacturing subsidiaries in Australia, Argentina, and Canada. In the United States it runs factories at Cambridge, Acton, and Adams, Mass.; Lockport, N. Y.; Chicago, Ill., and San Leandro, Calif.

Collyer to England for Cabot

Harry Collyer, formerly in charge of the rubber and plastics testing and technical service at the Boston research and development department of Godfrey L. Cabot, Inc., Boston, Mass., has been appointed laboratory director of Cabot Carbon, Ltd., Ellesmere Port, England, effective April 1.

This new Cabot furnace black plant, the first to be built in England under ECA, will produce 20 million pounds of carbon black annually from oils and other liquid raw materials. Mr. Collyer will be concerned with the maintenance of quality control of the plant by means of laboratory tests and will be coordinating his work with that of Joseph Hackett, works manager. Mr. Collyer will also be in charge of sales service, assisting sales, and will work, to a considerable extent, among customers.

Graduated from Tufts College in June, 1937, Mr. Collyer joined Colgate-Palmolive Peet Co. Then in 1942 he became research assistant in the division of industrial cooperation, at the Massachusetts Institute of Technology, Cambridge, Mass.

Fabian Bachrach

Harry Collyer

Under the direction of Drs. Hauser and le Beau, Mr. Collyer worked particularly with the development of synthetic rubbers and, specifically, the reclaiming process. In January, 1946, he came to the Boston Cabot research and development department, where his experience in rubber and plastics testing and in technical service has been broadened and deepened to make him the logical appointee to the English laboratory directorate. Mr. Collyer will be given additional intensive training until April 1 to add further emphasis to his present background at Cabot United States plants. He plans to arrive in England before the scheduled opening of the plant there.

Cabot Company Celebrates Christmas

Almost 200 Cabot employes attended a Christmas party given by the company at the Hotel Commander, Cambridge, December 19. After dinner an All-Cabot Talent Show was presented, followed by dancing. Everybody attending received a flower token. Cabot has sponsored such a Christmas party for its Boston employes for many years as well as an annual summer outing at a place of employes' preference. In the Southwest, where actual manufacture of carbon black takes place, employes enjoy barbecues and barn dances.

Thomas Cabot on Several Boards

Thomas D. Cabot, vice president, treasurer, and director of Godfrey L. Cabot, Inc., was one of four Bostonians recently elected to the board of John Hancock Mutual Life Insurance Co. Mr. Cabot, who is also a director and member of the executive committee of United Fruit Co., and a director of the First National Bank of Boston, was also one of two Boston executives reelected board members of the National Industrial Conference Board.

Fremont Adhesive for Tiling

Fremont Rubber Co., Fremont, O., has developed a new adhesive with waterproof properties said to be ideally suited for rubber tile and vinyl plastic cove base and sink topping applications. Designed to help installers minimize adhesive failures, the new compound spreads easily without balling, yet gives a strong, firm bond. Tile may be set up to 30 minutes after application of the adhesive, depending on climatic conditions and porosity of the underlying floor. The adhesive reaches full strength in four days, but floors can be walked on a few hours after laying. Because of the new adhesive's special formula, tools used in applying the material can be easily cleaned. The new product is available to dealers and distributers in quart, gallon, and five-gallon sizes.

Names New Distributer

Fred T. Lowry Linoleum & Rug Co., Inc., has been appointed distributer of Fremont Rubber products, including Supreme sponge rubber rug cushion, in Kansas City, Mo. Walter Cole, formerly Lowy's representative in the Missouri territory, is manager of the Kansas City branch. The Lowy company has been a Fremont distributer in St. Louis for several years.

Company's History Reviewed

Fremont Rubber was the subject of a story entitled, "Fremont's War Baby Grows Up," which appeared in the January 1 issue of the Toledo *Blade*. The story, by Roscoe Treier, gives an account of the origin and history of the five-year-old company which manufactures rubber floor tile and sponge cushioning for carpets. The company was founded by its president, R. P. Johnson, who had previously founded the Casto Rubber Co., Parkersburg, W. Va., and Crown Rubber Co., Fremont. Fremont Rubber was formed on July 1, 1944, to mill rubber for large firms in Akron. The plant was destroyed by fire in January, 1945, but was rebuilt and back in production by May of the same year. Four additions have since been constructed giving the plant a total of 100,000 square feet of floor area. In early 1946 the company entered the rubber tile field and later that year began manufacturing plastic film. These two products, together with sponge rubber carpet underlay, provide the company with sales of approximately $500,000 per month. Next year's sales are expected to be even higher, after the introduction of a new line of foam rubber products. Present employment is 350, and other officers of the company are: executive vice president, P. W. Clark; vice president, Eldon Frazier; secretary-treasurer, A. O. Dittman; and personnel director, A. P. Reed.

Rubber Reclaimers Elect

The Rubber Reclaimers Association, Inc., has announced the election of Robert E. Casey, general sales manager, Naugatuck Chemical Division of United States Rubber Co., as president for 1950. Elections were held at the Association's annual meeting on January 17, at which time D. S. Morse, vice president of Bloomingdale Rubber Co., was elected vice president of the group, and Charles T. Jansen, *Rubber Age*, was reelected secretary-treasurer. Jean H. Nesbit, president of U. S. Rubber Reclaiming Co., was again appointed chairman of the Association's executive committee, a post he has held several years.

The Association has issued a revised edition of its "Specifications for Scrap Rubber," dated January 17, 1950. The new specification is identical to the previous revision, dated January 11, 1949, except for certain minor provisions relating to labeling of different grades and financial arrangements on rejected or cancelled shipments.

CHEMICALS FOR INDUSTRY

ROHM & HAAS COMPANY

THE RESINOUS PRODUCTS DIVISION

Washington Square Philadelphia 5, Pa.

The Resinous Products Division was formerly The Resinous Products & Chemical Company

PARAPLEX is a trade-mark, Reg. U. S. Pat. Off., and in principal foreign countries.

DeVilbiss Advances Five

Promotion of five executives of DeVilbiss Co., Toledo, O., has been voted by the board of directors and was announced last month, by Howard P. DeVilbiss, president of the company, which manufactures spray painting equipment including booths, machines, hose and air compressors, and medicinal atomizers, vaporizers, and perfumizers. William A. Delger, former plant manager, became vice president in charge of manufacturing; Don J. Peeps, chief engineer, was advanced to vice president in charge of engineering; John M. Robinson, treasurer, was elected vice president and treasurer; Frank R. Pitt, the company's legal counsel, was named secretary; and R. Miles Booth, member of the treasurer's staff, was appointed assistant secretary and assistant treasurer.

Mr. Delger joined DeVilbiss in 1946, after service with an eastern firm as a consulting management engineering supervisor. Mr. Peeps entered the company's employ in 1928 as a factory worker, becoming chief engineer in 1944. Mr. Robinson came to DeVilbiss in 1946 as treasurer, with a background of factory accounting and public tax and accounting work. Mr. Pitt is legislative chairman of the National Paint, Varnish & Lacquer Assn.

The company's recently held service award dinner was attended by 117 persons with 25 or more years, representing nearly 8% of all DeVilbiss employes.

Forms Glove Firm

Champion Glove Corp., with factory and executive offices at 850 Metropolitan Ave., Brooklyn, N. Y., has been formed by Louis K. Braunston. Mr. Braunston, who has been active in the rubber and plastics field for the past 20 years, is president of the new firm, which will manufacture plastic-coated industrial work gloves. The company's patented formulation process, known as Champlex, gives a coating on cotton and canvas gloves said to be impervious to most acids, oils, solvents, and industrial chemicals. Two trade marked brands of gloves, Moldex and Champlex, will be marketed to the industrial and household trades. A special department has also been set up to coat wire, metal parts, cord, belting, tools, etc., with the Champlex process.

Other officers of the new company are Arthur A. Mayers, vice president and general sales manager; Henry R. Seidman, secretary and assistant sales manager; and Morton B. Harley, factory superintendent in charge of production.

Harris Products Co., manufacturer of mechanical rubber goods, has moved its main offices and plant to new and larger quarters at 1929 E. 61st St., Cleveland 3, O. The firm formerly was at 5105 Cowan Ave., Cleveland 4, with rubber factory at Milan, O.

Bakelite Corp., a unit of Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y., is now the Bakelite Division of Union Carbide. This change in corporate structure, adopted by all units, now divisions, of Union Carbide, involves no change in personnel or management.

Rubber and Plastics at Motor Boat Show

The fortieth annual National Motor Boat Show was held in Grand Central Palace, New York, N. Y., January 6-14. As in previous years, rubber and plastics items were much in evidence at the Show, which covered four floors of the Palace and featured the exhibits of 264 companies. Besides regular exhibits, there were also many educational displays, a series of boating forums, and a continuous showing of motion pictures dealing with boating.

As expected, rubber was noted in applications such as weatherstripping, combing bumpers, engine hose, engine mountings, and others. A noteworthy feature was the widespread use of latex foam cushioning in many of the boats displayed. In addition to these displays, Firestone Tire & Rubber Co.'s Foamex cushioning was shown by East New York Canvas Products Co.; Goodyear Tire & Rubber Co.'s Airfoam was exhibited by M. W. Fogg Co., Inc.; and United States Rubber Co.'s Koylon foam was displayed by Geschwind Foam Rubber Co., Inc. Among the other rubber exhibits was a display of B. F. Goodrich Co.'s cutless bearings by Lucian Q. Moffit, Inc., and the Klepper Co. exhibit, which included rubberized raincoats and fabrics.

The increasing use of plastics, both in structural and decorative applications, was also apparent. Almost every boat shown had at least a few plastic parts or products included, and this application of plastics ranged up to the all-plastic and impregnated Fiberglas boats shown by Beetle Boat Co. Vinyl upholstery continued to be the standard material for cushion and pad covers; a comprehensive display of such applications was featured by Atlantic-Pacific Mfg. Co. Other plastic uses included Dulux marine finishes shown by E. I. du Pont de Nemours & Co., Inc., and Casco resin glues displayed by the Borden Co. The Socony-Vacuum Oil Co. booth featured displays of oils and lubricants and the company's cruise guide service, with similar exhibits being shown by other petroleum companies at the Show.

NAWMD Convention

The thirty-seventh annual convention of the National Association of Waste Material Dealers, Inc., Times Bldg., New York 18, N. Y., will be held March 13-15 at the Waldorf-Astoria Hotel, New York, it was announced by Convention Chairman Paul J. White, Great Eastern Packing & Paper Stock Corp. Tentative plans call for a meeting of the Association's Scrap Rubber Institute on March 13 at 2:30 p.m. Final details of the various commodity meeting programs will be announced at a later date. Other features of the convention include the annual President's party on March 13; a ladies luncheon and style show on March 14; and the Association's annual banquet on March 15.

United States Testing Co., Inc., Hoboken, N. J., has established in Boston the Esselen research division, in which are combined the research personnal and facilities of U. S. Testing and Esselen Research Corp., 857 Boylston St., Boston 16, Mass.

Changes at Bearfoot Sole

Edwin E. Calvin has been named vice president in charge of personnel of The Bearfoot Sole Co., Inc., Wadsworth, O. The promotion was made public at the same time the company announced it and the United Rubber Workers Union had signed a new contract.

Mr. Calvin, son of Edwin Calvin, president and founder of the company, began working for Bearfoot Sole on March 16, 1938, in the cost department.

T. D. Calvin, son of Treasurer I. B. Calvin, has been promoted to the post of vice president and assistant treasurer of Bearfoot Sole, and he will continue his other duties as director of purchases and industrial engineer.

Edward Gulbis is the new vice president in charge of research and development of Bearfoot Sole. He joined the firm in 1938. After working in the laboratory he was made chief chemist in 1946 and research director in March, 1948.

Another change in the executive set-up at Bearfoot Sole is the election of Benjamin D. White as vice president in charge of engineering. Fourteen-year-old Ben White went to work for the New Castle Forge & Bolt Co. putting nuts on bolts; at 16 he was foreman over boys pointing gate hooks and next became foreman over threading machines. In 1915, when the plant was converted to New Castle Rubber Co., Mr. White helped install its machinery and in 1916, at the age of 21, was made master mechanic. When Seiberling Rubber Co. took over New Castle in 1919 and shipped its machinery to Barberton, O., Mr. White went with Seiberling as second-shift machine shop foreman. In 1928 he installed machinery for Chemetex Products Co. on the present site of the Bearfoot factory and for a while worked for both companies. When Mr. White transferred to Bearfoot he began working with experimental machinery and was given the title of chief engineer. He also has many machinery patents to his credit.

Thermoid Elects New Officer

At a meeting in Wilmington, Del., last month the directors of Thermoid Co., Trenton, N. J., elected Donald A. Fruland assistant treasurer to succeed the late Harry W. Searfoss. This election followed closely the appointment of Mr. Fruland as director of purchases by Thermoid. Mr. Fruland first joined the company's purchasing staff in 1947, having previously been with the Gulf Oil Corp. as marine purchasing agent.

Emil J. Houser was officially named assistant purchasing agent for Thermoid.

Michelin Realty Corp. has changed its name to Michelin Corp. and moved to Suite 2311, 29 Broadway, New York 6, N. Y., along with the U. S. Technical Research Corp.

The Perfecting Service Co., manufacturer of high-temperature and high-pressure flexible hose and ball bearing rotary unions, recently moved its plant and offices to 332 Atando Ave., Charlotte, N. C., as being close to many suppliers and more centrally located to the majority of the firm's customers in the Middle East. The new plant is now in full operation.

THE STORY BEHIND THE WORD...

KIBITZER...

In Germany, there is a "yappy" little bird called the kibitz. *One day as the famous chess player, Dr. Ziff, was engrossed in a serious game, an annoying onlooker questioned his moves. The testy old Doctor turned and said, "Go away you kibitz." From this incident comes our word* "kibitzer" *which describes a person like the one who annoyed Dr. Ziff.*

A long record of strength, stability and progressive leadership has made the word Muehlstein—the First Name in Scrap Rubber.

H. MUEHLSTEIN & CO. INC.

122 EAST 42nd STREET, NEW YORK 17, N. Y.

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CRUDE RUBBER · SYNTHETIC RUBBER · SCRAP RUBBER · HARD RUBBER DUST · PLASTIC SCRAP

U. S. Rubber Promotions

Herbert G. Kieswetter has been named assistant general manager of the mechanical goods division, United States Rubber Co., Rockefeller Center, New York 20, N. Y. He was formerly vice president and assistant general manager of United States Rubber Export Co., Ltd., which he had joined in 1925 as a salesman. He represented the company in many parts of the world, spending most of his time in the West Indies and in Latin America. In 1942 he was appointed assistant general manager and in 1945, vice president and assistant general manager of the export company.

Appointment of personnel to manage the newly acquired vinyl plastics operations of the Naugatuck Chemical Division, was announced January 18 by John P. Coe, vice president and general manager of the division. Harold M. Parsekian has been named manager of vinyl sales and will direct a national sales organization under George R. Vila, Naugatuck Chemical's general product manager for colloids, plastics, and agricultural chemicals. Clayton F. Ruebensaal will be vinyl operations manager, co-ordinating production, engineering and research; while M. N. Hilseberg, as manager of the Baltimore, Md., office, will direct credit and traffic and take charge of orders and billing.

Similar positions were held by these three men in the Glenn L. Martin organization before sale of the operations to the rubber company. They and other members of the Baltimore office will be transferred to U. S. Rubber's Naugatuck Chemical division office in Naugatuck, Conn., as soon as possible, probably by early summer. In the interim, mail for the Marvinol vinyl plastics operations should be addressed to Naugatuck Chemical, 501 E. Preston St., Baltimore 2, Md.

The acquisition by the rubber company also includes the Marvinol plant, employing about 200, in Painesville, O., where H. S. Curtis remains as plant superintendent and L. S. Howe as director of engineering.

Product Developments

Development of a new all-purpose decorative rubber floor matting, for use in hotels, schools, churches, restaurants, theaters, and office buildings, was announced by U. S. Rubber. The new matting has a distinctive waffle-like design which makes it easy to clean. The matting is especially designed for areas where regular corrugated matting is too light or unattractive and perforated mats are too heavy. The new matting can be laid over expensive carpeting during inclement weather to prevent the tracking of mud or dirt into building interiors. The new product is made in black, maroon, red, and green, in 3/16-inch thickness, and in 36-, 48-, and 52-inch widths.

A rapid increase in the use of foam rubber presser pads by dry cleaning establishments, hotels, tailors, and garment manufacturers throughout the country has been reported by U. S. Rubber. Each pad, individually wrapped, contains a Koylon foam pad, cotton padding, and an outer layer of scorch resistant, porous Asbeston. This combination of materials adds to the efficiency and life of the new-type presser pads, it is said. Field reports indicate that foam pads give three to six months' service, eliminate button and zipper breakage, reduce shine, provide a smooth and quick press, and give lower maintenance costs.

David D. Haldane

Matthew S. Fox

Commodity Exchange Elects

Members of Commodity Exchange, Inc., 81 Broad St., New York, N. Y., on January 17 at their annual meeting reelected five members to the board of governors and elected two new governors. One of the latter is David Douglas Haldane, vice-president of Littlejohn & Co., Inc., who was elected to represent the rubber trade group.

Then on January 19 the board held an organizational meeting at which officers of the Exchange were elected for the new year. Floyd Y. Keeler, special partner of Orvis Bros. & Co., was named president, and succeeding Mr. Keeler as treasurer of the Exchange is Joseph Fischer, head of Joseph Fischer & Co. Matthew S. Fox, a partner of Charles Slaughter & Co., was reelected one of five vice presidents. He represents the rubber interests on the Exchange board.

Paul Blum, former manager of the chemical and plastics department of Alan D. Oppenheimer, Inc., has organized the Paul Blum Co. with plant and offices at 315 Larkin St., Buffalo 10, N. Y., to supply industrial chemicals and by-products.

G-E Speed Variators

General Electric Co., Schenectady 5, N. Y., has announced that two 5/7½-h. p. G-E speed variators have been installed at the plant of the Chardon Rubber Co., Chardon, O., for driving tubing machines. The use of Speed Variators makes possible the wide range of driving speed needed for extruding the many types and sizes of mechanical rubber goods made by Chardon. The new machines are being used by the rubber company to provide a more flexible system of individual machine operation. Because of their compact unit design, the new units minimize space requirements and also eliminate the need of conventional separately mounted control panels, conduits, and wiring. No grouted cement foundation is necessary to install the Speed Variator, as the "package" is set on the floor at any desired distance from the drive motor or the operator's position. Since the units are independent of a common motor generator source, single unit failure will not affect all units on the line. In addition, maintenance of the "package" unit is held to a minimum because it is cooled by filtered air.

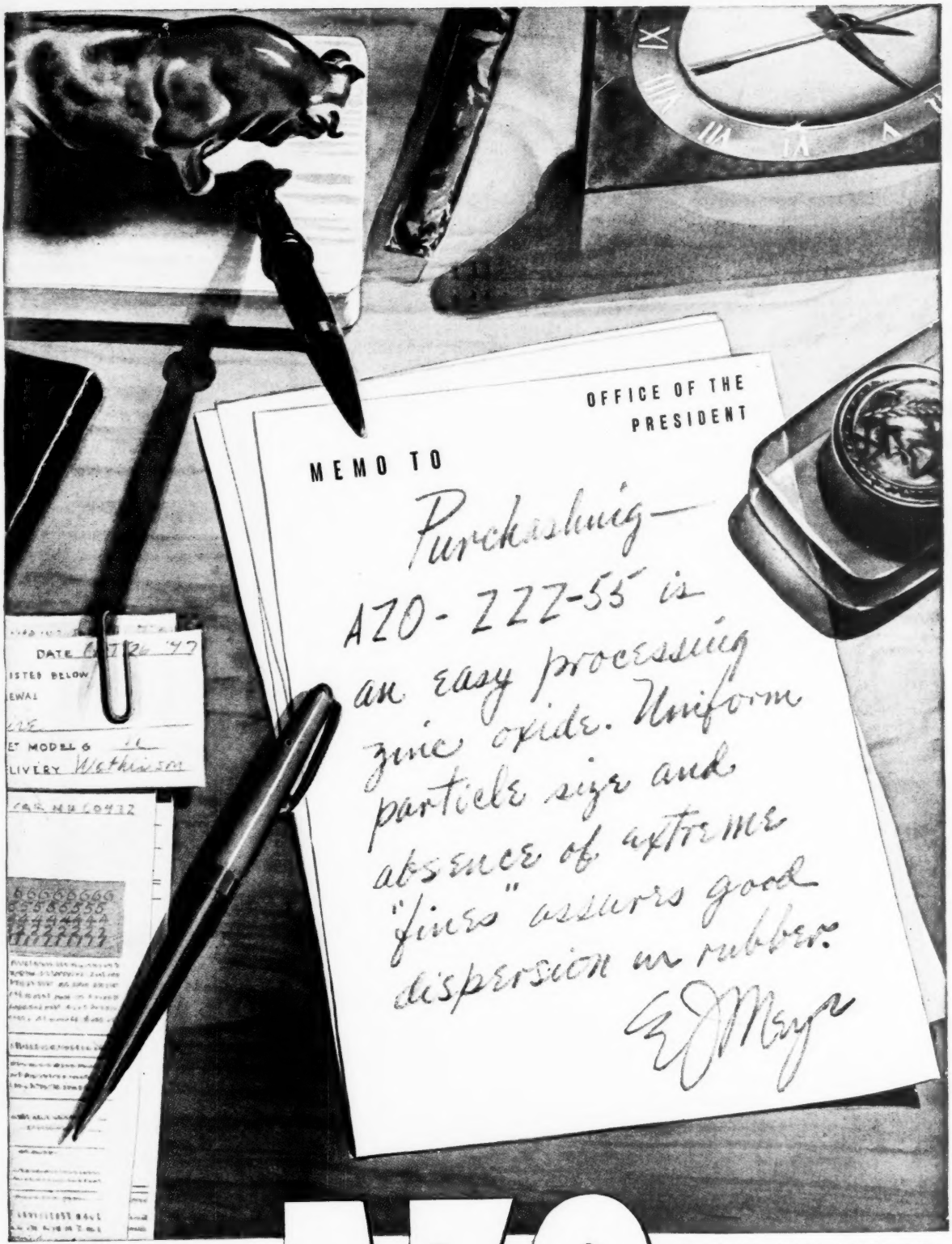
Personnel Advanced

George M. Hartley has been appointed manager of the Glyptal alkyd resin plant in Schenectady, it was announced January 16 by Paul F. Preston, manufacturing manager of the chemicals division. This plant manufactures resins for use in the paint industry, polyester resins for the coatings industry, plasticizers, varnishes, and other chemicals. Mr. Hartley, has been materials engineer for the chemicals division since last April. Prior to that he held positions in marketing research, advertising and sales promotion, and employe relations of the chemical department in Pittsfield. Before coming to General Electric in May, 1946, Mr. Hartley was employed as a metallurgical engineer in New York and served for 3½ years in the U. S. Navy.

J. Russell Watt has been appointed sales manager of industrial laminates and insulating materials for the G-E chemical department, with headquarters at Coshocton, O. Mr. Watt was graduated from Colgate University in 1938 and from graduation until 1942 was with the Borden Sales Co. He joined General Electric as a priority clerk in September, 1942 and, was appointed sales representative of the chemical department in January, 1946.

The Firestone Tire & Rubber Co., Akron, O., in its recent annual report to shareholders reported that production of natural rubber by the company's plantations in Liberia for the fiscal year ended October 31, 1949, increased to 57,558,000 pounds, a large part of which was shipped in the form of concentrated latex and pale crepe to meet an increasing demand for these rubbers.

Standard Machinery Co., Mystic, Conn., has appointed Walter H. Del Mar and the W. H. Del Mar Co., 5140 Crenshaw Blvd., Los Angeles, Calif., as its Pacific Coast representatives for the Davis-Standard line of extruding machines and accessories for the rubber, plastics, and wire industries. Mr. Del Mar is also Pacific Coast representative for Adamson United Co.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Purchasing—
AZO-ZZZ-55 is an easy processing zinc oxide. Uniform particle size and absence of extreme "fines" assures good dispersion in rubber.
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Uniform-Dependable AZO ZINC OXIDES

AMERICAN ZINC SALES CO.

Distributors for

AMERICAN ZINC, LEAD & SMELTING CO.

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Changes at Lee Tire

W. F. Hinderscheid, vice president in charge of sales of Lee Tire & Rubber Co. of New York, Inc., Conshohocken, Pa., recently announced the appointment of B. Herbert Lee as advertising manager.

Since 1926 the advertising department has been under the direction of George H. Duck, vice president, Lee Rubber & Tire Corp., in charge of public relations. Mr. Duck will now devote all his time to public relations for the corporation.

Mr. Lee, a grandson of the company the University of Virginia in 1948 after founder, J. Ellwood Lee, graduated from three years in the Signal Corps.

Opens New Texas Branch

Lee Tire & Rubber Co. is erecting new and modern service headquarters at 1809 N. Industrial Blvd., Dallas, Tex. The company's present branch, at 4122 Commerce St., has been under the managership of Ross Mishler since 1932. Lee officially established its first Texas branch in Dallas in January, 1923, to provide direct factory-trained service for its tires, tubes, and other automotive goods. For many years prior to 1923, Lee products had been sold through independent distributers.

Quaker Rubber Corp. Sold

All the capital stock of Quaker Rubber Corp., manufacturer of industrial rubber goods, Philadelphia, Pa., has been acquired by H. K. Porter Co., Inc., Pittsburgh, Pa. The acquisition was made by Porter further to diversify its activities and also to expand the business of Quaker. This purchase of Quaker's capital stock does not affect Quaker's corporate name, its assets, or its present financial position in any way whatsoever, and the former owners, R. P. Bremer and W. P. Cline, will remain with the company to manage the business for the new owners. No changes are anticipated in the company's operating policy in the future.

Quaker becomes one of several subsidiaries of the Porter company, which concerns will have new and substantial outlets for Quaker's products, resulting in further growth and expansion of Quaker's business, and will include the opening of branch warehouses in several important cities where they are needed.

American Tile & Rubber Co., Trenton, N. J., will conduct an advertising and merchandising campaign for Amtico rubber flooring during 1950 that will be the largest in the company's history. The campaign will include a series of advertisements in leading consumer, decorator, architectural, and trade publications backed up by a wide variety of printed material such as counter cards, direct mail folders, distributer sales presentations, and others. A similar program will also be conducted by the company's Canadian affiliate, American Tile & Rubber Co., Ltd.

Albert M. Kahn, president of Consolidated Machinery Products Co. and Acme-Hamilton Rubber Mfg. Corp., has been named chairman of the Greater New York Combined Campaign for Reform Judaism.

Goodyear Activities

The St. Marys, O., plant of Goodyear Tire & Rubber Co., Akron, O., is celebrating its tenth anniversary.

West Transferred to Luxembourg

Randolph B. West, Jr., of Goodyear's foreign operations department, leaves this month for Luxembourg, where the firm is preparing to open a new plant in the near future. Mr. West will be in charge of the establishment of a complete personnel department at the plant. This includes responsibility for setting wage scales and hiring native personnel, as well as the selection and training of a personnel director. In addition he will supervise the opening of a cafeteria in the new factory and other employe facilities.

Mr. West started with Goodyear in 1934 on the production squadron, became an inspector, and later a time-study man in the factory. In the latter capacity he was transferred to Jackson, Mich., in 1940, returned to Akron two years after as manager of the labor department at Goodyear Plant 2, the following year became personnel manager at the St. Marys, O., plant, and was recalled to Akron in March, 1948 as assistant to the personnel director. He transferred to foreign operations December 16, 1949.

Pliobond Notes

Pliobond, Goodyear's all-purpose adhesive which has proved highly successful in industrial applications, is now being marketed in two convenient household sizes by W. J. Ruscoe Co., Akron. Pliobond has been used successfully in joining the following materials to themselves and to each other: metal, wood, plastics, plastic films, fabric, ceramics, glass, vulcanized rubber, paper, leather, plaster and wall board, and concrete. The outstanding adhesive qualities of Pliobond also give promise of new wonders in household repairing, according to Mr. Ruscoe, with broken pottery, crockery, lamp shades, and toys being only a few of the many domestic articles on which the adhesive may be used with success.

Appointment of the Hayes Adhesives Co., 4159 Union Blvd., St. Louis, Mo., as a Pliobond distributer has also been announced by the Goodyear chemical division. Addition of this all-purpose adhesive rounds out the Hayes' line of vegetable and waterproof glues and adhesives, which the company has serviced to users for many years. Vernon J. Hayes, president and founder of the company, has been in the adhesive business since 1923. The new Goodyear adhesive distributer has a staff of technical sales representatives and modern laboratory facilities to aid in solving the most difficult bonding problems.

New Products Announced

A non-skid golf club grip which is said to provide an easy and comfortable hold in any weather is being manufactured by Goodyear's mechanical goods division. The new grip was invented by H. T. Goodwin, who states that anyone who can hit a golf ball with a club can wrap the Goodwin Flange Wrap Golf Grip around the handle of a club. No tools are needed to apply the grip; it is simply wrapped around the handle of the club and sealed with rubberized tape. The patented underlapping flange and tension in the resilient rubber prevent the grip from unwrapping after short service. The new grip is being distributed by Central States Industrial Supply Co., Cleveland, O.

A complete line of bicycle tire tubes made of black Butyl rubber is now being marketed by Goodyear, replacing the black natural rubber tubes previously made. Since many users still prefer the popular red natural rubber bicycle tubes, these will be retained in the company's line. According to M. F. Moyer, head of Goodyear's cycle tire department, combination of the black Butyl and red natural rubber tubes provides greater selectivity to the company's jobbers and the public.

Rubber in an Automobile

Owners of 1950 automobiles are riding around on a cushion of 94-143 pounds of rubber, depending on the model, according to a recent study by Goodyear engineers. There are 350-400 rubber parts in the modern car, exclusive of tires and tubes. These parts, including weatherstrips for windshields and windows, floor mats, dust seals, pedals, arm rests, windshield wipers, body shins, motor mounts, fan belt, radiator and heater hose, battery boxes, lamp gaskets, latex foam seats, etc., account for 70-100 pounds of rubber; while tires and tubes range from 24-43 pounds, depending on size and style. The increasing importance of rubber in the automotive industry is seen from the fact that the average car used about three pounds of rubber, in addition to tires and tubes, in 1925.

New Name for Subsidiary

United Engineering & Foundry Co., Pittsburgh, Pa., last month reported that the Indiana Department of State has approved an amendment to the articles of incorporation of the firm's Aurora, Ind., subsidiary whereby the name of the corporation will be Stedman Foundry & Machine Co., Inc., instead of Stedman's Foundry & Machine Works, Inc.

United Engineering Advances Brooks

United Engineering has elected F. F. Brooks, Jr., vice president, general manager, and a director of its subsidiary, Lobdell United Co., Wilmington, Del. Mr. Brooks started with United Engineering on October 3, 1927, in its Pittsburgh office. On September 8, 1942, he went to the firm's Frank Kneeland plant in Pittsburgh as assistant superintendent and on November 15, 1944, moved to the New Castle plant in the same capacity. Lobdell United manufactures paper mill machinery, calender stacks, paper mill rolls, paper and steel mill roll grinders, and Nazel forging hammers.

Franklin T. Peters has been assigned to the newly formed development department of Glyco Products Co., 26 Court St., Brooklyn, N. Y. He has been with the company, in the sales department, since 1947, following ten years with E. I. du Pont de Nemours & Co., Inc., in research positions. Dr. Peters will be available for consultation on new chemical products to be made in the extensive facilities available at Glyco's Natrium, W. Va., plant.

Specify

DOW CORNING SILICONE RELEASE AGENTS

to improve your quality and reduce your costs...

There's a Dow Corning Silicone to solve almost every release problem

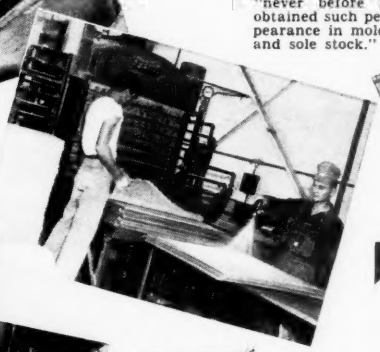
HEAVY SERVICE AND PASSENGER TIRES
One tire manufacturer reports saving $1500.00 a week in reduced mold maintenance costs alone.

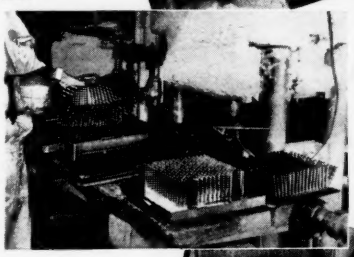
DC Mold Release Emulsion No. 35A
DC Mold Release Emulsion No. 35
DC Mold Release Fluid

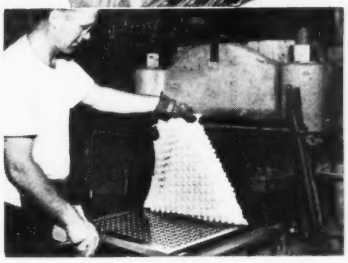
CURING BAGS

GREEN TIRE CASINGS
DC Mold Release Fluid reduces rejects to an all time low.

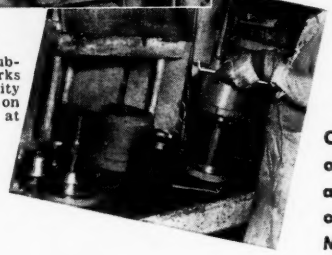
HEAVILY LOADED STOCK
"never before have we obtained such perfect appearance in molding heel and sole stock."







FAST CYCLE MOLDING
"the only mold lubricant that works on these 250 cavity deep draw molds on a 6 min. cycle at 350°F."



DEEP CAVITY MOLDS

"all production molds for floor tile now lubricated with DC MRE 35."

Call our nearest branch office for technical assistance on release problems or write for data sheet No. M-14.

WHITE STOCK
"DC MRE 35A gives easy release plus flawlessly white finish in molding heavily loaded white stock."

Have You tried **DC 1107 SILICONE**

TREATED "adhesive" PAPER

for use as interleaving sheets for uncured rubber? Available now from various paper mills or write Dept. 7.

Dow Corning

FIRST IN SILICONES

DOW CORNING CORPORATION, MIDLAND, MICHIGAN

ATLANTA • CHICAGO • CLEVELAND • DALLAS • LOS ANGELES • NEW YORK

In Canada: Fiberglas Canada, Ltd., Toronto • In Great Britain: Albright and Wilson, Ltd., London

WEST

Sibley, Others Promoted

The appointment of R. L. Sibley to the new position of special assistant to the general manager of the organic chemicals division of Monsanto Chemical Co., St. Louis, Mo., recently was announced by Division General Manager W. G. Krummrich. Dr. Sibley, who since 1943 has been general manager of the company's Rubber Service Department at Nitro, W. Va., will remain there at his own request to devote full time to the field of product development and to the growth of the department. He has been with the company since 1926, when he was employed as a patent attorney at Nitro. In 1929, Dr. Sibley was appointed research director, a position he held until 1943, when he was appointed general manager of the Rubber Service Department. Prior to his Monsanto association he taught chemistry at Hobart and Princeton and was assistant professor at Akron University. He also worked for Goodyear Tire and Standard Oil.

Richard O. Zerbe has been placed in charge of the patent work of the Rubber Service Department, according to J. Russell Wilson, director of the company's patent department. Mr. Zerbe was employed at the Monsanto plant at Nitro in 1936 as an assistant research chemist, was transferred to the patent department a year later, in 1940 was appointed patent attorney, and in December, 1948, was given the responsibility of organizing a newly created development department at Nitro. With this assignment successfully completed, Mr. Zerbe is resuming his patent work with increased responsibilities.

F. Faxon Ogden, sales development manager for Monsanto's Merrimac Division, Everett, Mass., joined the company's general development department in St. Louis on January 1, it was announced by W. Kenneth Menke, department director. Mr. Ogden will be primarily concerned with the broad evaluation and development of new products and fields for the company in his new assignment. In his former capacity, Mr. Ogden directed the marketing of Santocel, a silica aerogel now widely used as a space-saving thermal insulant. In addition he has had considerable experience in the general field of sales development. Mr. Ogden came to Monsanto as a research chemist with Merrimac in 1935, later served as assistant in the division's technical service department, as assistant branch manager of the company's New York sales office, and as manager of chemical sales development.

E. V. Prentice Co., 2303 N. Randolph Ave., Portland 12, Oreg., has been appointed exclusive Pacific Northwest sales representative of R. D. Wood Co., Philadelphia 5, Pa., manufacturer of hydraulic presses for the plywood, hardboard, plastics, rubber, and metalworking industries. The association of the 147-year-old R. D. Wood Co. with the Prentice company followed the visit to the West Coast of S. R. Rhoads, manager of Wood's hydraulic machinery division.

Howard Moore has been appointed California representative, with headquarters in Los Angeles, of Wright Mfg. Co., manufacturer of flooring, Houston, Tex.

Robert L. Reeves

Changes at Wyandotte

Robert L. Reeves has been named general sales manager of the J. B. Ford Division of Wyandotte Chemicals Corp., Wyandotte, Mich., and will supervise a North American field service force of more than 200 representatives who headquarter in 17 offices and who work closely with more than 1,500 jobbing organizations. Mr. Reeves has had 15 years sales management experience and recently was in charge of store merchandising for the 560 American units of The B. F. Goodrich Co. His merchandising experience includes promotion of major appliances, automotive supplies and accessories, as well as tires. In Akron he assisted both the Goodrich general sales manager and general merchandising manager. He also served four years with the Army-Navy Munitions Board, was discharged a lieutenant commander, and was cited by James Forrestal, the then Secretary of the Navy.

Retirement of C. B. Robinson, vice president of Wyandotte Chemicals in charge of the Ford Division, was announced January 25, but Mr. Robinson will continue to serve Wyandotte as a sales consultant. He joined the J. B. Ford Co., in 1917, working his way up until he became president of the J. B. Ford Sales Co. in 1929. In 1943, when the company was made a division of Wyandotte, he became vice president of the parent organization.

The Athletic Institute, a non-profit organization devoted to the advancement of athletics and recreation, 209 S. State St., Chicago, Ill., among its many members includes the following firms: Acushnet Process Sales Co., Bike Web Co., Brooks Shoe Mfg. Co., Brunswick-Balke-Collender Co., Burke Golf Co., Converse Rubber Co., Dewey & Almy Chemical Co., Dunlop Tire & Rubber Corp., The B. F. Goodrich Co., Haartz-Mason, Inc., Hyde Athletic Shoe Co., Kroydon Co., MacGregor Goldsmith, Inc., Meyercord Co., Ohio-Kentucky Mfg. Co., Pennsylvania Rubber Co., Rawlings Mfg. Co., Seamless Rubber Co., A. G. Spalding & Bros., Inc., United States Rubber Co., Virginia Rubatex Division of Great American Industries, W. J. Voit Rubber Corp., Wilson Sporting Goods Co., and Worthington Ball Co.

3M Expansion Program

Plans for the construction of a $3,000,000 office building by the Minnesota Mining & Mfg. Co., St. Paul, Minn., were announced January 13 by President R. P. Carlton, who pointed out that the new unit will relieve congestion in the present main office building, permit consolidation of other scattered office groups, and allow for future expansion. The new structure will be adjacent to the present three-level administration building.

Another part of the firm's nationwide expansion program is a two-story, block-long manufacturing plant now under construction at St. Paul. It is scheduled for completion next fall and will cost more than $2,000,000.

C. P. Pesek, the company's vice president in charge of engineering, expects new construction to begin within 60 days and the building be ready for partial occupancy by January 1, 1951. It should be completed by the Summer of 1951.

The office building is designed for seven floors and a full basement, although Mr. Pesek said only five floors and basement will be built for the present. The other two stories can be added when necessary.

The structure will be of reinforced concrete and masonry with a brick and stone exterior, will be fully air conditioned, and equipped with fluorescent lights throughout. A cafeteria is included in the plans.

Each floor will contain 34,320 square feet of space, with five floors having a capacity of more than 1,200 employes. Outside dimensions of the structure are 312 and 110 feet.

New Voit Vice Presidents

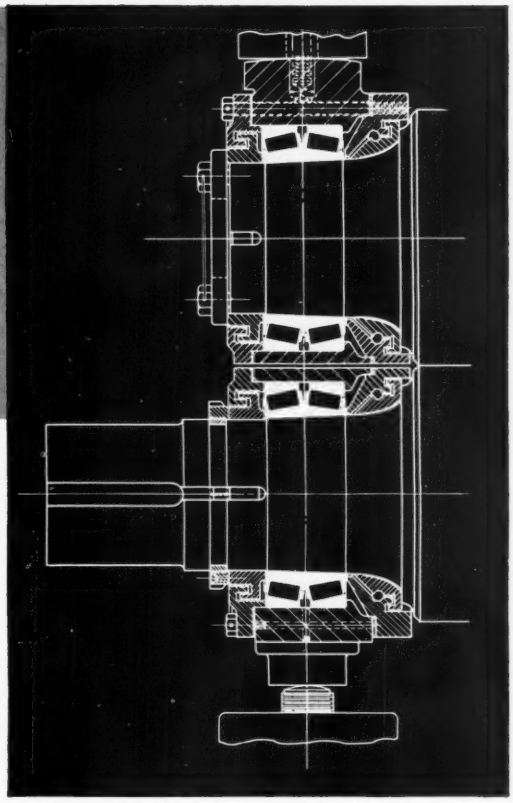
The election of Mell M. Barton and T. A. Kelly as vice presidents of the W. J. Voit Rubber Corp. 1600 E. 25th St., Los Angeles 11, Calif., recently was announced by President Willard D. Voit. The company previously had only one vice president, H. Page Parker, who continues in charge of production.

Mr. Kelly, whose long career in the sporting goods industry has made him a familiar figure throughout the East and Midwest, has been with Voit since 1941. He has been named vice president in charge of sales east of the Rockies. He makes his headquarters at the Voit Chicago, Ill., offices, recently moved from Wacker Drive to larger quarters at 350 W. Ontario St.

Mr. Barton, formerly western representative, has been associated with the Voit organization since 1935 in various sales and advertising capacities. He has been named vice president in charge of advertising and western sales, with headquarters in Voit's home offices.

Dow Corning Corp., Midland, Mich., has announced the availability of Sight Saver tissue dispensers for plant and office use. These tissues contribute to safety and improve morale by providing employes with a better and easier way to keep their eyeglasses and goggles clean. The new, attractive, metal wall dispensers hold a normal month's supply of the three- by seven-inch tissues impregnated with a special DC silicone that gives added clarity and luster to glass. Both dispensers and refill packets of tissues are now available from safety and office supply houses.

How Timken® Tapered Roller Bearings Help To Improve Plastics Production --Modify Costs



Timken bearing application for roll necks of plastics and rubber mills.

In plastics mills the use of Timken Balanced Proportion Bearings helps to make mills more rigid, because these bearings make possible larger roll neck diameters, with 50% to 60% increased roll neck strength and correspondingly higher bearing load ratings — up to 40% higher than with previous designs of tapered roller bearings, size for size.

In plastics calenders, where precision is the all-important factor, Timken bearings have proved their ability to provide and hold the extremely close gauge tolerances required in rolling the finest plastic sheet and film.

The advantages and versatility of Timken bearings are made possible by (1) scientific tapered design, (2) ability to carry radial, thrust and combined loads, (3) line contact of rolls and races assuring alignment of revolving parts, (4) superfine surface finish of rolls and races for utmost smoothness of operation and minimum wear.

Make sure you have Timken bearings in the machines you build or buy. Look for the trade-mark "TIMKEN" on every bearing.

THE TIMKEN ROLLER BEARING COMPANY, CANTON 6, OHIO • CABLE ADDRESS "TIMROSCO"

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

NOT JUST A BALL ○ NOT JUST A ROLLER ⊂⊃ THE TIMKEN TAPERED ROLLER ⊂⊃ BEARING TAKES RADIAL AND THRUST → LOADS OR ANY COMBINATION →

SUN "JOB PROVED" PRODUCTS CUT COSTS, S

Sun products have been "Job Proved" in the lubrication of almost every type of mining, manufacturing, power, and transportation equipment . . . in refrigeration and air-conditioning . . . in metal cutting, tempering, and quenching . . . in the processing of textile fibers, leather, natural and synthetic rubbers . . . in the impregnation of electrical, electronic, and packaging materials of many kinds.

To help you solve your production problems, Sun Oil Company offers a wide selection of "Job Proved" petroleum products, plus the experience of Sun Engineers. Their know-how and detailed product information are yours for the asking. Call your local Sun office, or write Dept. RW-2.

SUN OIL COMPANY • PHILADELPHIA 3, PA.

In Canada: Sun Oil Company, Ltd., Toronto and Montreal

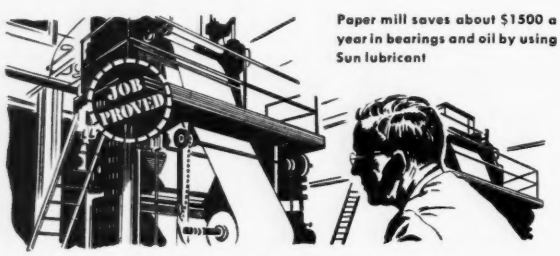
INDUSTRIAL OILS

SUNVIS 900 OILS—High-viscosity-index, paraffinic-type oils—of uniform O F pour point—fortified against rust, corrosion, oxidation, and sludge. The finest available lubricant for turbines, hydraulic systems, and similar applications.

SUNVIS HD 700 OILS—High-viscosity-index oils containing additives which minimize oxidation and give detergency. Ideal lubricants for internal combustion engines subjected to continuous heavy loads under the most adverse conditions.

SUNVIS OILS—Solvent-refined paraffinic-type oils of uniform high viscosity index, low pour point, and low carbon content. Especially suitable for application to long-time use in all types of industrial reservoirs and circulating systems.

DYNAVIS OILS—Low-pour-point, high-viscosity-index, inhibited oils, containing an additive which helps prevent formation of harmful corrosive and sludge-forming acids. Well suited for engines fitted with alloy bearings and operated at high temperatures.



Paper mill saves about $1500 a year in bearings and oil by using Sun lubricant

SOLNUS OILS—Well-refined straight mineral oils. Stand up under hard use for long periods of time. Recommended for use in machine tools, air compressors, certain types of diesels, etc.

CIRCO OILS—Used for general lubrication of industrial machinery when straight mineral oils are required.

SUNTAC OILS—100%-petroleum products which have been compounded to increase their adhesiveness. Recommended for general lubrication of all machines subjected to sudden shocks and load reversals. Cling to the parts to be lubricated.

STEAM CYLINDER OILS—High flash and fire point lubricants for either saturated or superheated steam conditions and for worm-gear speed-reduction units.

SUN CAR JOURNAL OILS—Dark oils meeting A.A.R. Specifications. For use in waste-packed bearings of railroad equipment.

SUN DELAWARE OILS—Dark oils for general lubrication on older types of industrial machinery.

SUNOCO WAY LUBRICANT—For use on tableways. Eliminates chatter and scoring . . . resists corrosion. Has good metal-wetting and adhesive properties, ample viscosity, and E. P. qualities.

SUN MARINE ENGINE OILS—Compounded with special emulsifying agents in order to provide adhesion to, and lubrication of, working parts in the presence of water. For the lubrication of bearings, eccentrics, crossheads, and various other parts of steam engines.

ROCK DRILL OIL—High-film-strength adhesive oil. For use in jackhammers, stopers, drifters, and similar equipment.

INDUSTRIAL GREASES

SUN CUP GREASES—Water resistant. For grease-cup and grease-gun application when service is normal.

SUN GUN GREASES—Smooth greases made with medium-viscosity oil. Stable under pressure in power and booster guns.

ADHESIVE PRESSURE GREASES—Won't drip or splash. Excellent lubricants for open-gear applications.

SUN DARK PRESSURE-SYSTEM GREASES—For power-driven central grease lubricating systems in heavy industries. Also used as a "medium cup grease."

SUN MINE CAR GREASES—Available in several grades. Suitable for both antifriction bearings and plain-bearing cavity-type wheels.

SUN MINING MACHINE LUBRICANT—Semifluid. For use where a light but adhesive grease is required. Resists separation and decomposition.

Chemical plant saves about $8000 per year by adopting Sun Pressure Grease

SUN ROLLER BEARING GREASES—For use on electric motors and generators and high-temperature machinery equipped with ball or roller bearings.

SUN GEAR COMPOUNDS—Black adhesive open-gear compounds and

"JOB PROVED" IN EVERY INDUSTRY

SUN PETROLEUM

TS, SPEED PRODUCTION, IMPROVE QUALITY

wire-cable greases. Recommended for power presses, mining machinery, worn reduction mills, crushers, pump gears, etc.

SUNOCO TRACTOR ROLLER COMPOUND—For crawler-type tractors. Provides good lubrication with exceptional sealing qualities.

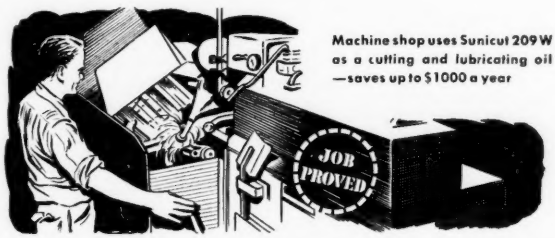
METALWORKING OILS

SUNICUT—Straight (non-emulsifiable) transparent cutting oils. Recommended for automatic screw machines and heavy-duty machining operations. Permit high speed production with excellent finishes, long tool life.

SUNOCO EMULSIFYING CUTTING OIL—A self-emulsifying oil which produces a stable white emulsion. Efficient and economical cooling and lubricating medium for turning, milling, drilling, and other metalworking operations on both ferrous and nonferrous metals. It is also an excellent grinding coolant.

SUN QUENCHING OILS—Specially refined oils designed to aid development of maximum physical properties in a wide variety of steels.

SUN TEMPERING OILS—Specially refined oils for tempering steel. Because of their low carbon content and stability under heat, these oils have an unusually long service life.



Machine shop uses Sunicut 209W as a cutting and lubricating oil —saves up to $1000 a year

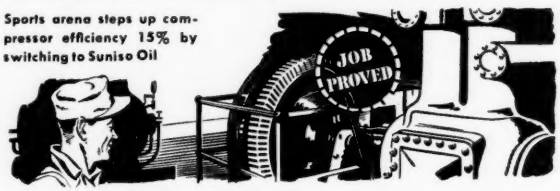
SUN ROLLING OILS—Straight and emulsifying oils which will permit maximum production in rolling steel, aluminum, brass, and copper.

SUN ANTI-RUST COMPOUNDS—Petroleum-base oils with chemical additives designed to prevent the rusting and corrosion of steel.

REFRIGERATION OILS

SUNISO REFRIGERATION OILS—Have extremely low pour points, extremely low wax-separating characteristics, a high degree of stability and long life. Initially neutral and resistant to formation of detrimental acids under service conditions. Suniso Oils are high quality oils suitable for both high- and low-temperature operations. The most widely used oils in refrigeration and air-conditioning.

Sports arena steps up compressor efficiency 15% by switching to Suniso Oil

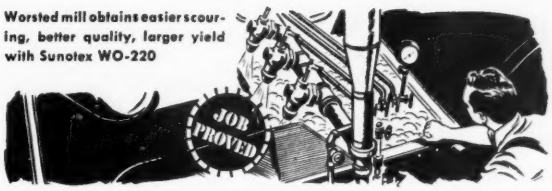


TEXTILE-PROCESSING OILS

SUNOTEX TEXTILE OILS—Designed to impart certain additional properties to various forms of fibers during their processing from the fiber state into a manufactured product. All Sunotex textile oils are emulsifiable in water. Highest rating in fadometer tests.

SUN COTTON CONDITIONING OILS—Pale mineral oils which condition the cotton. They prevent waste by cutting down excessive amounts of "fly" (fine air-borne lint particles).

Worsted mill obtains easier scouring, better quality, larger yield with Sunotex WO-220



SUN ASBESTOS FIBER CONDITIONING OIL—Used for spraying on the asbestos during processing. Fibers are kept from being damaged or broken down, and harmful dust is minimized when this product is used.

SUN CORDAGE OILS—Generally used alone, but are adaptable to various formulas used by cordage manufacturers. Selected products, highly compatible with additives.

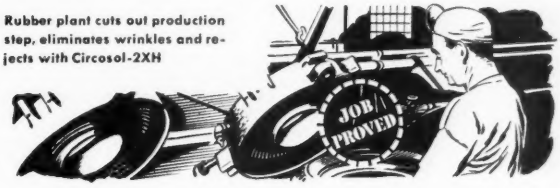
RUBBER-PROCESSING AIDS

CIRCOSOL-2XH—An elasticator and processing aid for natural rubber and especially for GR-S. Outstanding for sponge rubber.

CIRCO LIGHT PROCESS AID—A processing agent and excellent softener for natural rubber, natural rubber reclaims, and neoprene synthetic rubber. Used for GR-S to some extent.

SUNDEX-53—An inexpensive product suitable for processing GR-S and blends of GR-S and natural rubber. An established processing aid for rubber footwear stocks and semihard rubbers.

Rubber plant cuts out production step, eliminates wrinkles and rejects with Circosol-2XH



CIRCOMAR-5AA—A black-colored product for processing natural and GR-S rubber used in tire-making. Also used in reclaiming natural-rubber scrap. Replaces asphalt fluxes. Free-flowing at room temperature.

WAXES

Sun's new wax plant was completed in 1949. Its many refining innovations and extreme flexibility permit new types of waxes to be manufactured in large quantities—a procedure heretofore impracticable. A wide range of fully refined paraffin and microcrystalline waxes will be "tailor-made" to meet the requirements of virtually all major industrial applications. Pilot plant samples of several grades are now available.

MISCELLANEOUS INDUSTRIAL PRODUCTS

SUN SOLVENTS—Sun Spirits for the thinning of paints, varnishes, and enamels, and for metal-cleaning . . . a pure, water-white petroleum solvent free of corrosive sulphur. Other Sun solvents with special properties are available for the chemical industry.

SUN LEATHER OILS—Mineral-base leather oils. Used for obtaining the desired tensile strength, proper temper, and controlled moisture content. Maintain a light even color . . . mix well . . . distribute evenly.

"JOB PROVED" IN EVERY INDUSTRY

PRODUCTS

SUNOCO

NEWS ABOUT PEOPLE

Robert D. Juve

Robert D. Juve has been named to the newly created post of executive assistant to N. E. Ries, factory manager of The Mohawk Rubber Co., Akron, O. Mr. Juve will be in charge of all development and compounding. A native Akronite, with The Goodyear Tire & Rubber Co. for ten years, Mr. Juve started in research on synthetic rubber, spent a year as synthetic rubber coordinator, and prior to his appointment was doing research compounding in rubber and plastics. He was graduated from Purdue in 1939 with a B.S. degree in chemical engineering and is a son of the late Walter H. Juve, consulting rubber technologist and WPB member. At the termination of World War II, Robert Juve was a member of the first team of Rubber Reserve to investigate German rubber plants for the Office of Rubber Reserve. Author of several technical papers, he is also councilor of the Akron section, A. C. S., and past secretary of that group.

R. C. Swain, vice president of American Cyanamid Co., Stamford, Conn., on January 16 was appointed chairman of the committee on chemical warfare of the Research and Development Board, Department of Defense, Washington 25, D. C. He has been on the committee since October, 1948.

Frank G. Breyer, member of the New York consulting metallurgical and chemical engineering firm of Singmaster & Breyer, will be given honorary membership in The American Institute of Chemists at a meeting of the New York Chapter on February 15 at the Hotel Commodore, New York. Mr. Breyer is honored for his important applications of chemistry and engineering in industry. His outstanding contributions have been in non-ferrous metallurgy (the recovery and purification of zinc, magnesium, copper, nickel, and uranium and their compounds from the native ores) and in the related fields of application of these products. These include pigments, paints, inks, rubber, and the graphic arts, in both their economic and processing phases.

E. V. Murphree, president of Standard Oil Development Co., Rockefeller Center, New York 20, N. Y., received the Perkin Medal of the Society of Chemical Industry at a dinner-meeting at the Waldorf-Astoria Hotel in New York, on January 6. In his acceptance speech Dr. Murphree emphasized that industry's faith in research and expenditure of capital is one of the major factors in increasing the standard of living. The incentive comes from expectation of increased profits, and he hopes we never see the day when through restrictive legislation or other governmental action this expectation ceases to exist, Mr. Murphree added.

Paul F. Niessen, for the past five years director of research and development, has been elected to the board of directors of Victor Mfg. & Gasket Co., 5750 Roosevelt Rd., Chicago 90, Ill., where he is presently the assistant general works manager. He is also vice chairman of the Chicago Rubber Group and a director of the Division of Rubber Chemistry, American Chemical Society.

John Paul Remensnyder has been elected president of Heyden Chemical Corp., 393 Seventh Ave., New York, N. Y., to succeed Bernard R. Armour, who died December 1. Mr. Remensnyder has been with the company since 1920, was elected a director and vice president in 1944 and has been in charge of sales.

The Heyden directorate also decided to continue the management committe appointed after the death of Mr. Armour. This committee includes Mr. Remensnyder; R. Lulek and S. Askin, vice presidents and directors of the company; and P. van der Stricht, secretary and also on the board.

Clyde W. Gray has been taken on as executive vice president of Stowe-Woodward, Inc., Newton Upper Falls, Mass., manufacturer of the Stonite and other rubber covered rolls and the Ebonite bowling ball. Mr. Gray comes to Stowe-Woodward directly from his most recent connection with Ford, Bacon & Davis, industrial and management engineer, for whom he not only served a large industrial clientele, but functioned as general manager of its atomic bomb operation at Oak Ridge, Tenn., in 1944 and 1945.

Chandler T. White has been elected vice president of General Aniline & Film Corp., 230 Park Ave., New York 17, N. Y. Mr. White, with the organization 30 years, has been general manager of the General Aniline Works (dyestuffs) Division of the company and will continue as such.

Haskell H. Fritts has been elected vice president of the Baker Castor Oil Co., 120 Broadway, New York, N. Y., and assumes the responsibilities of director of sales. He joined the company as district manager of its Chicago office in 1943 and was promoted, after three years, to manager of Castung sales operating from the New York office. In 1948 he went to Southern Shellac Mfg. Co. as vice president, but returned to Baker Castor Oil last month.

George Zinzalian

George Zinzalian has been appointed sales manager of the technical products division of E. F. Drew & Co., Inc., 15 E. 26th St., New York 10, N. Y. Dr. Zinzalian has been with the company for more than 16 years, serving in important capacities including supervision of production, product development, and research at the Boonton, N. J., plant. Dr. Zinzalian will direct the sales and service activities of the technical products division and textile and leather oils departments and will be responsible for the sale of all products produced by these departments including fatty acids, textile detergents, sulfonated oils, synthetic esters, cationic softeners, yarn processing chemicals, and leather oils.

John C. Hampson, former Indiana field representative for Pennsylvania Salt Mfg. Co.'s special chemicals department, has been named sales manager for the department's newly formed Chicago district, with offices at 20 N. Wacker Dr., Chicago, Ill.

David E. Allen, has been named sales manager of Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y. In this newly created post, Mr. Allen becomes assistant to L. R. Love, general sales manager of the company. Following graduation from Annapolis in 1922, Mr. Allen was employed as an electrical engineer by public utility companies and joined Anaconda in March, 1932. Since then he has occupied sales and engineering posts with the company except for four years' sea duty in the Navy during World War II.

H. B. Morris has resigned as technical director of the Eagle Rubber Co. Mr. Morris, who was associated with Firestone Tire & Rubber Co., Naugatuck Chemical Division of United States Rubber Co., and more recently with Killian & Shunk before he joined Eagle Rubber in 1947, is establishing a consulting service in Ashland O., for the rubber and plastics fields. He will also become president of M. & M. Foundation, Inc., a corporation founded to develop, manufacture, license, distribute, and sell special products, the first of which is a bottle and wick type of health aid which is reported to be effective against air-borne bacteria and virus.

Mr. Vinyl Grows Up...

with help from

S/V SOVALOID C

From a scrawny infant weighing in at a mere million pounds to a rugged, 250-million-pound giant . . . that's the story of young Vinyl's phenomenal growth in just ten years! And this great new industry is still growing . . . thanks to an important assist from Socony-Vacuum's highly efficient, low-cost plasticizer — *S/V Sovaloid C!*

S/V Sovaloid C costs but a fraction of the price of conventional ester-type plasticizers, yet gives you many special processing advantages. It adds greater tensile strength to your products . . . imparts excellent flexibility at normal temperatures . . . provides unusual oil-resistant qualities. It is completely compatible with all vinyl compounds, and will not migrate from finished products.

Here's another advantage . . . in many cases, *S/V Sovaloid C* can be used as an extender of more costly plasticizers — again reducing your processing costs and increasing your sales possibilities. Get all the facts about *S/V Sovaloid C* from your Socony-Vacuum Representative.

SOCONY-VACUUM OIL COMPANY, INC.
and Affiliates: MAGNOLIA PETROLEUM COMPANY
GENERAL PETROLEUM CORPORATION

Socony-Vacuum Process Products

Process Products
SOCONY-VACUUM

This Figure Prepared with Vinylite Brand Plastics.

Richard A. Parsekian has joined Pioneer Latex & Chemical Co., Middlesex, N. J., heading the development and sales of vinyl resin dispersions for various industrial applications. Mr. Parsekian was formerly a technical sales representative for the plastics dispersion department of Warwick Chemical Division, Sun Chemical Corp.; a rubber research chemist for The Flintkote Co., where he did considerable sales service work, and was with the research laboratories of Columbian Carbon Co.

Allen H. Ottman, vice president, American Hard Rubber Co., 11 Mercer St., New York 13, N. Y., was elected treasurer of the National Management Council at its annual meeting at the Statler Hotel, New York, on January 10.

David A. Paterson has been elected a director of General Latex & Chemical Co., Cambridge, Mass., to succeed the late Lawrence Clayton. Mr. Paterson is a senior partner of H. A. Astlett & Co.; a past president, a director and a member of the Rubber Trade Association of New York, Inc., a member and a former director of Commodity Exchange, Inc., and trustee of Colby Junior College. Mr. Paterson has been in the import and export business in New York for more than 40 years, handling principally rubber and burlap.

CANADA

Dow of Canada Expanding

A $5,000,000 expansion of Dow Chemical Co. of Canada, Ltd., holdings in Sarnia, Ont., was begun in 1949, bringing the total value of the company's holdings there to some $17,000,000. The company's long-range objective is a $40,000,000 establishment. The latest expansion program calls for four big plants, a laboratory expansion, and a tank washing center. The Canadian subsidiary of Dow Chemical Co. came to Sarnia shortly after Pearl Harbor to design and operate the styrene monomer plant for Polymer Corp., Ltd. With an eye for the potentialities of plastics, agricultural and industrial chemicals in Canada, Dow began expanding its operations. By March, 1949, four major units were in production, manufacturing polystyrene, ethylene glycol, chlorine, and caustic soda. Projects in 1949 called for a caustic evaporation plant, expansion of the ethylene glycol plant which is meeting all of Canada's demands for anti-freeze, a chlorinated hydrocarbon building, a maintenance building, and a new research laboratory.

Polymer Corp., Ltd., Sarnia, Ont., is estimated to have produced 50,000 tons of synthetic rubbers during the past year, an amount approximately equal to the best previous year, according to company officials. Production in 1948 was 40,000 tons; 1947, 42,000 tons; and 1946, 51,000 tons. The company has grown steadily since its formation and now produces approximately 20 types of Polysar-S rubbers and latices and some 10 types of Butyl rubber. In addition Polymer now also produces oil resisting rubbers, high styrene rubbers, "cold rubber," and a special type of Butyl. "Cold rubber" is being manufactured and sold under the trade name Krylene, and oil resisting rubbers under the name of Polysar-N. Polymer's sales effort this year will result in the sale for export of some 60% of the productive capacity and valued at about $10,000,000. The company now has agents handling its sales in all of the principal countries of Western Europe, besides its agents in the United States.

FINANCIAL

The Armstrong Rubber Co., West Haven, Conn., and wholly owned subsidiary, Lake Shore Tire & Rubber Co., Des Moines, Iowa. Year ended September 30, 1949: net earnings, $656,287, equal to $1.51 a class A and B share, compared with $1,697,930, or $4.35 a combined share, in the previous 12 months; net sales, $31,501,237, against $33,297,908; provision for federal income taxes, $405,083, against $936,818; current assets, $11,874,258, current liabilities, $3,905,056, against $14,265,481 and $6,545,518, respectively, on September 30, 1948.

Dow Chemical Co., Midland, Mich., and subsidiaries. Six months ended November 30, 1949: net profit, $15,133,416, equal to $2.68 each on 5,183,791 common shares, contrasted with $14,467,722, equal to $2.64 each on 4,994,824 shares, in the comparable period of 1948; income taxes, $9,181,581, against $9,230,761.

Glidden Co., Cleveland, O., and subsidiaries. Year ended October 31, 1949: net profit, $6,191,923, equal to $3.23 a common share, compared with $9,276,819, or $5.04 a share, in the preceeding fiscal year; net sales, $160,143,276 against $202,318,794.

Firestone Tire & Rubber Co., Akron, O. Year ended October 31, 1949: net income, $17,823,621, equal to $8.81 each on 1,951,334 common shares, contrasted with $27,674,344, or $13.83 a share, in the preceding fiscal year; net sales, $579,606,107, against $633,858,425; income taxes, $12,350,000, against $21,850,000; provision for contingencies, $0, against $4,000,000; reserve for earnings of foreign subsidiaries, $5,169,652, against $0; inventories, $117,308,771, against $139,534,371; current assets, $215,948,315, current liabilities, $47,020,133, against $241,605,176 and $80,888,394, respectively, on October 31, 1948.

Lee Rubber & Tire Corp., Conshohocken, Pa., and subsidiary. Year ended October 31, 1949: net income, $1,211,499, equal to $4.78 each on 253,584 capital shares, contrasted with $1,996,741, or $7.87 a share, a year earlier; net sales, $31,947,034, against $35,702,493; federal and state income taxes, $815,752, against $1,307,658; current assets, $16,808,044, current liabilities, $1,978,052, against 116,067,338 and $2,307,845, respectively, on October 31, 1948.

Midwest Rubber Reclaiming Co., East St. Louis, Ill. Year ended October 31, 1949: net income, $392,506, equal to $1.11 a common share, compared with $674,105, or $2.10 a share, in the previous fiscal year; net sales, $4,240,241, against $5,578,689.

Raybestos-Manhattan, Inc., Passaic, N. J., and domestic subsidiaries. Three quarters ended September 30: net profit, $1,162,556, equal to $1.85 a share, against $1,480,350, or $2.36 a share, a year earlier.

Thermoid Co., Trenton, N. J., and subsidiaries. First nine months, 1949: net profit, $481,412, equal to 50¢ each on 752,366 common shares, contrasted with $681,458, or 77¢ each on 752,417 shares, in the 1948 months; federal income tax, $358,898, against $446,950; sales, $4,547,423, against $9,809,453.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Baldwin Rubber Co.	Com.	$0.10 extra	Jan. 26	Jan. 16
	Com.	0.15 q.	Jan. 26	Jan. 16
Brown Rubber Co.	Com.	0.25 q.	Mar. 12	Feb. 18
Crown Cork & Seal Co., Inc.	Com.	0.25	Feb. 28	Feb. 7
	Cum. Pfd.	0.50 q.	Mar. 15	Feb. 21
Crown Cork & Seal, Ltd.	Com.	0.50 q.	Feb. 15	Jan. 14
Dayton Rubber Co.	"A"	0.50 q.	Jan. 25	Jan. 10
	Com.	0.15	Jan. 25	Jan. 10
Denman Tire & Rubber Co.	Pfd.	0.12½ q.	Jan. 3	Dec. 20
Detroit Gasket & Mfg. Co.	Com.	0.12½ extra	Jan. 25	Jan. 10
	Com.	0.12½ q.	Jan. 25	Jan. 10
DeVilbiss Co.	Com.	0.25 yr. end	Jan. 20	Jan. 10
Endicott Johnson Corp.	Com.	0.40	Jan. 2	Dec. 27
	4% Pfd.	1.00 q.	Jan. 2	Dec. 27
Firestone Tire & Rubber Co.	Pfd.	1.12½ q.	Mar. 1	Feb. 15
General Cable Corp.	1st Pfd.	1.00 q.	Jan. 3	Dec. 28
	2nd Pfd	0.50 q.	Jan. 3	Dec. 28
Goodall Rubber Co.	Com.	0.15 extra	Jan. 16	Jan. 3
	Com.	0.15	Feb. 15	Feb. 1
Goodyear Tire & Rubber Co.	Com.	1.00 q.	Mar. 15	Feb. 15
	Pfd.	1.25 q.	Mar. 15	Feb. 15
Goodyear Tire & Rubber Co. of Canada, Ltd.	Pfd.	0.50 q.	Jan. 31	Jan. 10
Byron Jackson Co.	Com.	0.50 q.	Feb. 15	Jan. 31
Johns Manville Corp.	Pfd.	0.87½ q.	Feb. 1	Jan. 11
Johnson & Johnson	Pfd. A	1.00 q.	Feb. 1	Jan. 16
Lee Rubber & Tire Corp.	Com.	0.50 q.	Feb. 1	Jan. 19
Mansfield Tire & Rubber Co.	Pfd.	0.30 q.	Jan. 2	Dec. 15
Midwest Rubber Reclaiming Co.	Com.	0.25 q.	Feb. 1	Jan. 14
	4½% Pfd.	0.56¼ q.	Apr. 1	Mar. 14
Okonite Co.	Com.	1.00 q.	Feb. 1	Jan. 16
Thermoid Co.	Pfd.	0.62½ q.	Feb. 1	Jan. 16
Union Asbestos & Rubber Co.	Com.	0.25 q.	Apr. 3	Mar. 10
S. S. White Dental Mfg. Co.	Com.	0.37½ q.	Feb. 14	Jan. 30
Whitehead Bros. Rubber Co.	Com.	0.15	Feb. 15	Feb. 1
Whitney Blake Co.	Com.	0.10 incr.	Jan. 6	Dec. 7

milestones of progress in rubber making

Here are some dates to remember in the development of the rubber industry:

Thiokol

1931 *Neoprene*

Nitrile Rubber

1943 *GR-S*

GR-S Cold

1949 *No. 1 Ribbed Smoked Sheets—Plus**

* A MAJOR DEVELOPMENT in the processing of rubber is now possible with Calco's new plasticizer, PEPTON® 22. Added to the latex prior to coagulation, it forms No. 1 Ribbed Smoked Sheets—Plus.

PEPTON 22 Plasticizer can also be added to GR-S or natural rubber in the open mill or in the banbury.

In all cases it cuts breakdown time at least 50%, reduces power consumption, improves processing qualities—without affecting the physical or aging characteristics of rubber.

Calco

AMERICAN Cyanamid COMPANY
CALCO CHEMICAL DIVISION
RUBBER CHEMICALS DEPARTMENT
BOUND BROOK, NEW JERSEY

SALES REPRESENTATIVES AND WAREHOUSE STOCKS: Akron Chemical Company, Akron, Ohio • Ernest Jacoby and Company, Boston, Mass. • Herron & Meyer of Chicago, Chicago, Ill. • H. M. Royal, Inc., Los Angeles, Calif. • H. M. Royal, Inc., Trenton, N. J. • In Canada: St. Lawrence Chemical Company, Ltd., Montreal and Toronto

New Jersey Zinc Co., New York, N. Y. First nine months, 1949; net profit, $3,362,144, equal to $1.86 each on 1,960,000 capital shares, against $6,361,542, or $3.25 a share, in the same months of the prior year.

A. G. Spalding & Bros., Inc., New York, N. Y. Year ended October 31, 1949: consolidated net earnings, $944,827, equal to $1.81 a share, compared with $1,536,403, or $2.95 a share, in the preceding fiscal year; sales, $20,9 7,362, against $23,359,034.

Union Asbestos & Rubber Co., Chicago, Ill. Nine months ended September 30, 1949: net profit, $616,643, equal to $1.24 a share, compared with $1,040,385, or $2.10 a share, in the corresponding months of 1948: net sales, $7,178,695, against $9,402,073.

OBITUARY

Louis J. de Holczer

LOUIS J. DE HOLCZER, an executive of Crown Cork & Seal Co., Inc., Baltimore, Md., died December 23 in Orlando, Fla., after a brief illness. Rosary services were held in Fairchild Funeral Home, Orlando, December 23. Requiem High Mass was sung at St. Emory's Catholic Church, Bridgeport, Conn., December 27, followed by interment in St. Michael's Cemetery.

Mr. de Holczer was born in Merza, Hungary, 69 years ago. He was a graduate of the Royal Hungarian University of Budapest.

In 1913 he came to the United States and joined the Firestone Tire & Rubber Co. He was subsequently connected with The B. F. Goodrich Co. and Gates Rubber Co. and in 1931 joined the technical division of the United States Rubber Co. He became associated with Crown Cork 13 years ago.

The deceased was also a member of the American Chemical Society.

He is survived by his wife, three sons, a sister, two granddaughters, and one grandson.

James K. Irvin

AFTER a long illness James K. Irvin, former sales manager of the United States Rubber Co. plant at Caracas, Venezuela, died in a Dobbs Ferry, N. Y., hospital on January 22. Services were held at Irvington-on-Hudson, N. Y., January 24, followed by cremation.

Mr. Irvin was born in Chicago, Ill., on July 8, 1912. He attended Francis Parker School, Deerfield Academy, and Dartmouth College.

He joined United States Rubber Export Co. in August, 1936, as a trainee and advanced through various sales positions. He was sent to Caracas in January, 1948, but ill health compelled his return to New York in the Summer of 1949. He was named an assistant to a sales manager in the Export company, but his health interferred.

The deceased is survived by his parents, his wife, and two sons.

James P. Dunphy

JAMES P. DUNPHY, 61, eastern pigment sales manager for The New Jersey Zinc Sales Co., died January 3 at his home in Brooklyn, N. Y., after an illness of several months.

For the past 32 years he had been connected with New Jersey Zinc Sales, serving successively as chief clerk, sales representative, and eastern pigment sales manager. He previously had been employed for eight years by the Consolidated Edison Co.

He is survived by his wife, two sons, one daughter, and several grandchildren.

Resin Adhesive

(*Continued from page* 559)

coated with the adhesive, brought together, and held with pressure sufficient to maintain uniform contact. The resulting bond is strong, moisture and weather resistant, and permanent.

The adhesive is supplied in two parts: a reddish brown resin composition, and a liquid activator mixed in with the resin immediately prior to use. Two liquid activators are available: one, a fast reacting type which gives rapid initial set and has a short pot life of 20-30 minutes; and the other, a slower reacting type with a pot life of four to five hours. The adhesive begins to set as soon as the resin is mixed with the activator, and, like all chemical reactions, curing time is retarded by cold and hastened by heat. At room temperature the glue line will develop about half its strength overnight with the fast activator and in 24-36 hours with the slower activator.

Hauser to Give Elastomer Colloid Chemistry Course

A THREE weeks' special course in the colloid chemistry of elastomers will be given during the summer session at Massachusetts Institute of Technology, it was announced by Professor W. H. Gale, director of the session. Designed primarily for engineers and scientists from the rubber and plastics industries, the course will be given by Ernst A. Hauser, a leading authority in the field.

Beginning with an introductory review of modern colloid chemistry, the course will cover: chemical composition and molecular structure and configuration of matter exhibiting elasticity; techniques necessary to a study of these factors; colloidal phenomena involved in the production of synthetic elastomers; variations found in the properties of elastomers owing to different types of polymerization; changes polymers undergo and interfacial reactions which take place in various manufacturing processes; modern developments in the field of compounding ingredients; and the current status and future possibilities of silicone elastomers.

The course will be held on weekday mornings from June 26 to July 14. Opportunities will be offered for additional discussion periods, seminars, and demonstrations in the afternoons. Tuition for the course will be $90, and academic credit given for satisfactory completion of the course to those who pass a final examination. Letters of application indicating education background, and whether academic credit is desired, should be addressed to Professor Gale at M.I.T., Room 3-107, Cambridge 39, Mass. Dormitory and dining facilities are available, and enrollees will have full use of the Institute's libraries and recreational facilities.

Hard Water Correctors

REMARKABLE results in the use of Sprex AC and Supreme water hardness suppressants are reported by DuBois Co., Cincinnati, O. Small quantities of the supressants have proved extremely effective in conditioning hard water used in spray or dip systems with the company's Latex-Lube and Liqui-Lube liquid dusting agents. The use of only a few hundredths of a per cent of these suppressants is said to extend the life of the dip solution and prevent gum formation of stock inclusions in the hardest water. In view of the small amounts of Sprex AC or Supreme needed, DuBois will package these chemicals in convenient small units.

Chicago Chemical Exposition

THE Sixth National Chemical Exposition by the Chicago Section, American Chemical Society, to be held in the Chicago Coliseum on September 5-9, will be a bigger and better show than ever before, according to committee Chairman Marvin C. Rogers, R. R. Donnelley & Sons Co. The Exposition will run concurrently with the one hundred eighteenth national meeting of the A. C. S. in Chicago and is expected to attract an attendance of more than 50,000 persons.

Other members of the committee who will assist Dr. Rogers include G. G. Lamb, Northwestern University; O. G. Linnell, R. R. Donnelley; T. C. Marron, A. B. Dick Co.; C. S. Miner, Jr., Miner Laboratories; A. E. Schneider, Armour Laboratories; H. W. Schultz and B. N. Rockwood, both of Swift & Co.; and H. F. Schwarz, Sherwin-Williams Co.

Foreign Trade Opportunities

The firms and individuals listed below have recently expressed their interest in buying in the United States or in United States representations. Additional information concerning each import or export opportunity, including a World Trade Directory Report, is available to qualified United States firms and may be obtained upon inquiry from the Commercial Intelligence Unit of the United States Department of Commerce, Washington, D. C., or through its field offices, for $1 each. Interested United States companies should correspond directly with the concerns listed concerning any projected business arrangements.

Export Opportunities

Nissho Co., Ltd., Taiko Bldg., 45, Harimamachi Ikutaku, Kobe, Japan: carbon black.

Etablissements Penguin, H. & K. Momjian Frères, Rue Malek Farouk, Aleppo, Syria: toys and sporting goods.

V. M. Hindia, representing Kalamazoo Parchment Paper Co. (India), 40 Cowasji Patel St., Fort, Bombay, India: plastics molding machinery.

Luiz La Saigne, representing Mesbla S. A., Rua do Passelo 48/54, Rio de Janeiro, Brazil: aviation and automotive equipment, radios, machinery and industrial equipment, electrical supplies, toys and sporting goods.

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APPLICATION

United States

2,489,277. **Acoustic Tube Including a Corrugated Tubular Portion of Resilient Material.** R. A. Faralla, Long Branch, N. J., assignor to the United States of America, as represented by the Secretary of War.

2,489,429. **Pneumatic Shoe Retaining Device of Flexible Rubber.** G. J. Nathan, Washington, D. C.

2,489,545. **In a Seal for the Space between a Pair of Relatively Rotatable Members an Elastic Seal Sleeve between a Floating Seal Rig and Its Bearing.** J. E. Storer, Indianapolis, Ind., and A. J. Timmer, Dayton, O., assignors to General Motors Corp., Detroit, Mich.

2,489,623. **In a Throttling Valve, a Resilient Closure Member with a Plurality of Stepped Annular Faces on Its Under Side.** J. J. Delany, assignor to Delany Realty Corp., both of Brooklyn, N. Y.

2,489,643. **In Heating and Pressing Apparatus, a Flexible Article-Contacting Bag Enclosing Heating Means Including a Non-Conductive Flexible Matrix in Which Electrically Conductive Rubber Strips Are Embedded.** W. H. Hunter, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,489,715. **Packing Member Composed of a Non-Rigid, Non-Porous Plastic Chemically Inert to the Substances Coming in Contact Therewith.** C. Mark, Jr., Wilmette, Robert Hula, Riverside, and H. J. Alwart, Chicago, assignors to Clayton Mark & Co., Evanston, all in Ill.

2,489,743,-744. **In a Process for Treating Fresh Citrus Fruits in Preparation for Marketing, the Use of a Sheet of Foamed Rubber on Which to Roll the Fruit to Remove Excess Treating Fluid.** E. M. Brogden, assignor to Carpenter Co., both of Orlando, Fla.

2,489,791. **Printer's Blanket Including a Resilient Impression Layer of Soft, Rubber-Like Material Resistant to Ink Materials and Solvents, and Integral therewith, a Backing of Stretch-Resistant Material Including Tension Members of Woven Glass Fibers.** L. R. Liles, Cuyahoga Falls, and E. W. Chapman, Akron, both in O., assignors to B. F. Goodrich Co., New York, N. Y.

2,489,799. **Inflatable Ice Removing Apparatus for Aircraft.** R. J. Minshall, Shaker Heights, O., assignor, by mesne assignments, to Borg-Warner Corp., Chicago, Ill.

2,489,818. **In a Water Carrier for Minnows, a Rubber Hose Connecting a Tube in the Upper Portion of the Device with an Air Suction Supply.** L. L. Roe, Wichita, Ka.

2,489,831. **In a Truss Pad, a Rigid Member and a Rubber Member Secured to Each Other.** R. E. Sutherland, Fayette, Ala.

2,489,845. **In a Christmas Tree Stand, a Suction Base Including a Flat Rubber Sheet Cupped into a Pocket in the Base.** A. O. Zedler, Yonkers, N. Y.

2,489,901. **For a Motor Vehicle Windshield, and Ice Shield Held in Place by Vacuum Cups and Elastic Bands and Fasteners Secured to the Shield.** C. J. Kocinski, Struthers, O.

2,489,985. **An Article of Manufacture Including a Roll of Alternate Spiral Convolutions of Fibrous Material Impregnated with a Copolymerizable Composititon Including an Alkyd Resin and a Styrene, and a Removable Sheet of Relatively Impervious Material.** F. Y. Speight, Jr., Greenwich, Conn., assignor to American Cyanamid Co., New York, N. Y.

2,489,995. **Puncture-Proof Self-Sealing Pneumatic Tire.** C. Young, East St. Louis, Ill.

2,490,168. **Sinus Medication Applicator Including a Rubber Tube.** O. A. Strauss, Chicago, Ill.

2,490,250. **Plastics Protective Cover for Pressure Cookers.** G. Boener, assignor to Seal-Sac, Inc., both of New York, N. Y.

2,490,285. **Hair Retainer Formed of an Elastic Strand Provided with Teeth.** R. A. Smith, Los Angeles, Calif.

2,490,402. **Mounting of Soft, Inherently Resilient Material for Bobbin Magazines.** C. P. Bergstrom, Millbury, assignor to Crompton & Knowles Loom Works, Worcester, both in Mass.

2,490,433. **Electrically Heated Windshield Including Two Layers of Glass Bonded to a Layer of Transparent Plastic Material, Which Extends Beyond the Margin of the Glass to Provide a Gasket Portion.** W. F. Gunning and E. H. Pier, Los Angeles, Calif., assignors to Douglas Aircraft Co., Inc., Santa Monica, Calif.

2,490,511. **In a Check Valve Including a Casing in Which Is Mounted a Poppet, a Rubber-Like O-Ring Seal in a Groove in the Poppet.** L. B. Courtot, assignor to Weatherhead Co., both of Cleveland, O.

2,490,552. **In a Syringe, a Rubber Piston Stopper Having a Recess and an Integral Portion Forming an Outer Wall for the Recess.** A. E. Smith, Los Angeles, Calif.

2,490,556. **Swimming Trunks Having a Pocket in the Body Portion Provided with an Inflatable Bladder.** H. Spack, New York, N. Y.

2,490,576. **Electric Receptacle Including a Body Member of a Resilient Rubbery Composition.** S. P. Bower and F. P. Warrick, both of Detroit, Mich.

2,490,652. **Cylindrical Rubber Plugs for Mounting a Gib in a Guide for Elevators.** E. A. Sahlin, Harrington Park, N. J., assignor to Otis Elevator Co., New York, N. Y.

2,490,721. **Salt Shaker with a Resilient Rubber Plunger.** H. D. Via, Portsmouth, Va.

2,490,981. **For Garment Pressing Machines, a Unitary Buck Pad Including a Layer of Porous, Resilient Heat-Resisting Synthetic Material with Apertures therethrough.** R. H. Reiss, New York, N. Y., and C. S. Powell, Morristown, and P. R. T. Hahn, Westfield, both in N. J., assignors to Reiss Mfg. Corp., Wilmington, Del.

2,491,004. **In a Pipe Coupling, a Deformable Annular Packing Member of an Elastomer.** J. B. Graham, South Hills, Pa., assignor to National Tube Co., a corporation of N. J.

2,491,097. **The Use of a Film of Polyethylene in Making Teeth of an Acrylic Compound.** R. C. Feagin, Flushing, assignor to Austernal Laboratories, Inc., New York, both in N. Y.

2,491,188. **In a Flat Power Transmission Belt, a Deformable Rubber Mastic between a Leather Traction Surface and a Fabric Layer, Embedding and Securing to the Fabric Stretch-Resisting Cord Strands.** S. D. Lesesne, assignor to Graton & Knight, Co., both of Worcester, Mass.

2,491,360. **Foundation Garment of a Tubular Seamless Elastic Material.** C. Brown, New York, N. Y.

2,491,396. **For Uniting Two Other Layers of Fabric, a Woven Fabric Including Potentially Adhesive Threads.** M. Seckel, deceased, late of Enschede, Netherlands, by Ernest J. Seckel, executor, Enschede, Netherlands.

2,491,422. **Moisture-Proof Cigar Wrapper.** J. E. Snyder, Camp Carson, Colo., assignor to Wingfoot Corp., Akron, O.

2,491,423. **Package for Fruits or Vegetables.** J. E. Snyder, assignor to Wingfoot Corp., both of Akron, O.

2,491,491. **Anti-Skid Pneumatic Tire Having a Tread Portion in Which Are a Number of Inflatable Pockets.** W. H. Freygang, Essex Falls, assignor to Kidde Mfg. Co., Inc., Bloomfield, both of N. J.

2,491,557. **Inflatable Rubber Air Cell Mattress.** G. L. Goolsbee, Beaumont, Tex.

2,491,596. **Rubber Cushion Interposed between Plates Carrying a Golf Shoe Spike.** M. J. Zaleski and R. L. Richards, both of Chicago, Ill.

2,491,698. **A Pair of Rubber Diaphragms in a Shock-Absorbing Wheel.** H. W. Walden, New York, N. Y.

2,491,734. **In a Coupling for Shafts Including Three Conical Metal Sleeeves Nested together, Rubber Resilient Material Filling the Spaces between Their Axially Overlapped Portions.** A. J. Horst, assignor to Metalastik, Ltd., both of Leicester, England.

2,491,803. **Steering Wheel Cover of Thin Elastic Plastic Film.** A. de Heras and D. G. Bowden, assignors to Armand Mfg., Inc., all of Los Angeles, Calif.

2,491,909. **Picker Bumper for Loom.** C. Saurer, Detroit, Mich., assignor to Ohio Rubber Co., Willoughby, O.

2,491,957. **Flexible Industrial Safety Shield of Plastic Material.** W. Dilley, Cleveland, O.

2,491,974. **In a Sprocket Drive for Moving Stairways, Synthetic Rubber Material Bonded to the Outer Faces of Bodies for Engaging the Sprocket Chain to Reduce Noise of Operation.** H. E. Hansen, New York, N. Y., assignor to Westinghouse Electric Corp., East Pittsburgh, Pa.

2,492,030. **Hollow Rubber Boot in Sealing Means for Valves Operated by Longitudinally Movable Rod Element.** H. L. Beekley, Glen Ellyn, Ill., assignor, by mesne assignments, to Electrimatic Co., a corporation of Ill.

2,492,051. **Elastic Selvage Threads Knitted with Loop Ends of Weft Threads in a Selvage.** C. F. Libby, Stoughton, Mass.

2,492,183. **Ear Plug of Resilient and Compressible Material.** M. C. Rosenblatt, New York, N. Y.

2,492,219. **In a Pair of Chain Wheels Rotatable about Spaced Axes, Synthetic Rubber Ring as Chain Tensioner.** J. C. Haefeli, assignor to Austin Motor Co., Ltd., both of Birmingham, England.

2,492,225. **Elastic Pressure Valve.** A. S. Kester, assignor to Rauland Corp., both of Chicago, Ill.

2,492,326. **Douche Syringe and Container Assembly.** V. E. Scotti, Pittsburgh, Pa.

2,492,384. **Stomach Irrigation Tube of Transparent Plastic Material.** A. L. Kaslow, Hollywood, Calif.

2,492,433. **Lightweight Resilient Tire.** J. V. Martin, Rochelle Park, N. J.

2,492,488. **Molding Material Consisting of Particles of Inactive Organic Filler Coated with a Rubbery Diolefin Polymer and Supercoated with a Resin.** H. Kremer, London, England.

2,492,568. **The Use of a Thermoset Converted Thermoplastic Cement in the Manufacture of Electrical Conductor Cables.** R. Gillis, Snyder, assignor to Western Electric Co., Inc., New York, both in N. Y.

2,492,689. **Friction Tape Including a Supporting Sheet of Cellulose Textile Fibers, and a Reclaim Rubber Insulating Composition Impregnating This Sheet.** M. M. Danovitch, Norwood, assignor to Plymouth Rubber Co., Inc., Canton, both in Mass.

2,492,699. **For Transporting Cargo on Water, a Collapsible Cylindrical Bag of Flexible Waterproof Material.** R. Houwink, Wassenaar, assignor to Rubber-Stichting, Delft, both in the Netherlands.

2,492,740. **Rubber Valve in a Sound Creating Device.** W. A. Garratt, assignor to P. G. Vondersmith, both of Covington, Ky.

2,492,800. **Fast-Rising Sounding Balloon Having a Non-Elastic Outer Envelope and an Elastic Inner Envelope.** L. W. Isom, Belmont, assignor to Dewey & Almy Chemical Co., North Cambridge, both in Mass.

2,492,890. **Inflatable Shoulder Pad with a Covering Formed from Sections of Synthetic Plastic Material.** S. Sameth, New York, N. Y.

2,492,916. **Rubber Shoe on a Crutch Tip.** R. J. Chute, Shaker Heights, and E. I. Peck, Cleveland Heights, both in O.

2,492,917. **In a Valve, Rubber-Like Valve Button.** L. B. Courtot, assignor to Weatherhead Co., both of Cleveland, O.

Dominion of Canada

461,454. **For a Pressure-Sensitive Adhesive Tape, a Primer Including Particles of Hydrophobic Vulcanized Rubber.** V. N. Morris, Highland Park, N. J., U.S.A., assignor to Johnson & Johnson, Ltd., Montreal, P.Q.

461,457. **Annulus of Rubber in a Resilient Mounting.** R. C. Henshaw, assignor to Lord Mfg. Co., both of Erie, Pa.

461,478. **Electrotype Matrix Molded from a Sheet of Vinyl Acetate-Vinyl Chloride Copolymer.** R. E. Kreber, executor of the estate of F. W. Kreber, deceased, in his lifetime of Columbus, O., and B. W. Gonser and R. M. Schaffert, co-inventors, assignors to Printing Plates Research Inc., all of Columbus, O., U.S.A.

461,486. **Liquid-Tight and Airtight Flexible Element in a Washing Machine.** H. J. Rand, Westport, Conn., assignor to H. J. Rand Washing Machine Corp., Cleveland, O., both in the U.S.A.

461,517. **Rubber Elements in a Submarine Signal Detector.** R. Black, Jr., South Orange, and F. F. Romanow, Summit, both in N. J., assignors to Bell Telephone Laboratories, Inc., assignor to Western Electric Co., Inc., both of New York, N. Y., both in the U.S.A.

461,543. **Plastic Inner Soles from Layers of Plastic Fabric.** F. L. Dale, New York, N. Y., U.S.A.

461,560. **In an Abrasive Wheel, a Separable Elastic Annular Tread in a Casing.** M. E. Landau, Brooklyn, N. Y., U.S.A.

461,584. **In a Suction Roll Seal Assembly, Including a Relatively Rigid Sealing Strip Slidably Mounted in a Well in a Suction Gland, an Inflated Resilient Tube in the Bottom of the Well Acting on the Strip to Prevent Leakage around it.** L. Hornbostel, assignor to Beloit Iron Works, both of Beloit, Wis., U.S.A.

461,627. **Resilient Sleeve in a Dead-End Coupling.** W. Larymore, Drummoyne, assignor to Keeseal, Pty. Ltd., Mascot, both in N. S. W., Australia.

461,638. **In an Assembly for Mounting in the Ring Groove of a Piston and Including Metallic Snap Rings to Fill the Width of the Groove, a Continuous Rubber-Like Sealing Ring Underlying the Metallic Rings.** M. W. Huber, Watertown, assignor to New York Air Brake Co., New York, both in N. Y., U.S.A.

461,651. **Squeegee in a Decorating Machine.** B. Martin, Washington, assignor to Solar Laboratories, Beaver, both in Pa., assignor to C. V. Beck, Jr., Toledo, O., assignor to Solar Engineering & Equipment Co., Beaver, both in the U.S.A.

461,672. **Welt for Shoes, Composed of Vinyl Chloride Material Having Character-**

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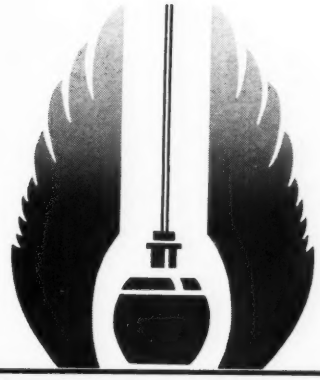

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istics Equivalent to Koroseal or Vinylite. W. C. Wright, deceased, in his lifetime of Brookfield, N. H., assignor to Wright-Batcheldder Corp., Boston, Mass., both in the U.S.A.

461,689. **In a Textile Fiber Drafting Roll, a Hollow Cylindrical Roll Cover Including an Incompressible Inner Reinforcing Layer to Which Is Bonded an Outer Drafting Facing Layer Formed of a Mixture of Butadiene-Acrylonitrile Rubber Binder and Cork Particles.** E. J. Courtney, Oaklyn, N. J., U.S.A.

461,696. **In the Cylindrical Finger Receiving Opening in a Bowling Ball, a Resilient Rubber Insert Fixed within the Wall about the Opening.** C. W. Jerome, Detroit, Mich., U.S.A.

461,753. **The Use of Furan Resin Material in the Manufacture of Hardboard.** O. Spence, assignor to Masonite Corp., both of Laurel, Miss., U.S.A.

461,908. **Load Ring of Resilient Material for a V-Belt.** A. C. Daman, assignor to Mining Process & Patent Co., both of Denver, Colo., U.S.A.

461,922. **Diaphragm of Rubber or Like Flexible Material in a Container for Powder, Etc.** A. G. Rose, assignor to Rose Bros. (Gainsborough), Ltd., both of Gainsborough, Lincolnshire, England.

United Kingdom

631,428. **Industrial Belts.** Dayton Rubber Co.

631,539. **Stretchable Wall.** B. F. Goodrich Co.

631,615. **Suspenders for Hose, Etc.** M. E. and T. M. Coventry.

631,617. **Mechanical Fabrics and Belts Formed therefrom.** United States Rubber Co.

631,834. **Resilient Suspension Means for Vehicles.** Dunlop Rubber Co., Ltd., and R. M. Seddon.

631,880. **Fluid-Operated Disk Brakes.** Dunlop Rubber Co., Ltd., and H. J. Butler.

632,521. **Rubber Springs.** G. S. Moulton & Co., Ltd., A. E. Moulton, and O. H. Varga.

632,541. **Flexible Bearings.** Silentbloc, Ltd., and V. A. Trier.

PROCESS

United States

2,489,373. **Moldable Composition in Pellet Form.** E. H. Gilman, Plainfield, N. J., assignor to Bakelite Corp., a corporation of N. J.

2,489,466. **Thermoplastic-Stiffened Permeable Sheet Material.** A. F. Schramm, Jr., White Plains, N. Y.

2,490,451. **Protective Coverings of Flexible Thermoplastic Material.** S. H. Magid, Larchmont, N. Y.

2,490,946. **Stretching and Laminating Thermoplastic Sheet Material with Other Sheet Material.** W. S. Cloud, Wilmette, Ill.

2,491,048. **Tubing from Thermoplastic Material.** W. L. Jenkins, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,491,281. **Making Vulcanizing Patches.** M. H. Rowe, Dallas, Tex.

2,491,527-528. **Plastic Binders.** P. V. Spinner, assignor to Plastic Binding Corp., both of Chicago, Ill.

2,491,715. **High-Density Molded Articles from Cork and an Elastomer.** R. E. Clayton, Jr., Cranford, N. J., assignor to Standard Oil Development Co., a corporation of Del.

2,492,000. **Thin Rubber-Like Films.** H. B. and R. O. Morris, assignors to F. B. Killian & Co., all of Akron, O.

United Kingdom

630,451. **Cutting Raw or Crude Rubber.** H. R. Williams.

630,528. **Artificial Filaments, Films, Etc.** J. W. Fisher, H. Bates, and E. W. Wheatley.

631,031. **Sponge Rubber.** International Latex Processes, Ltd.

631,305. **Reinforcing Solid Rubber Objects by Wire to Make Them Flexible and Stay in a Given Position.** P. Lamda.

631,644. **Battery Separators.** United States Rubber Co.

631,817. **Coating Wires, Etc.** Veedip, Ltd., S. D. Sutton, and E. A. Coward.

631,837. **Packings from Rubber and Asbestos.** K. Klinger.

631,850. **Decorating Articles Having Surfaces Composed of a Synthetic Resin.** Dunlop Rubber Co., Ltd., and M. A. Harper.

631,945. **Thermoplastic Molding Pellets.** S. Nixon.

632,022. **Electric Cables.** W. T. Glover & Co., Ltd., and N. Dixon.

632,109. **Bonding Textile Yarns to Rubber.** Courtaulds, Ltd., and D. Entwistle.

632,208. **Cellular Materials from Rubber, Plastics, and Bituminous Composition.** Expanded Rubber Co., Ltd., A. K. Unsworth, A. G. Goodchild, and A. Cooper.

632,390. **Processing Synthetic Rubbers.** British Thomson-Houston Co., Ltd.

632,586. **Molding Organic Plastic Materials.** Dow Chemical Co.

632,588. **Rubber Latex Products.** Dunlop Rubber Co., Ltd., and W. H. Chapman.

Dominion of Canada

461,410. **Laminated Plastic Articles.** A. W. Prance and F. Lyijynen, assignors to Briggs Mfg. Co., all of Detroit, Mich., U.S.A.

461,427. **Obtaining Clear Films from Ethylene Polymers.** H. G. Ingersoll, Wilmington, Del., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q., assignor to E. I. du Pont de Nemours & Co., Wilmington.

561,428. **Preparation of Non-Porous Polytetrafluoroethylene Articles.** J. Alfthan, New York, N. Y., U.S.A., assignor to Canadian Industries Ltd., Montreal, P.Q., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., U.S.A.

461,438. **Gas Expanded Rubber Material.** A. Cooper, assignor to Expanded Rubber Co., Ltd., both of Croydon, Surrey, England.

461,799. **Producing a Batting Material from Loosely Matted Thermoplastic Staple Fibers.** F. G. Dodge, Cumberland, Md., and G. Schneider, assignors to C. Dreyfus, both of New York, N. Y., both in the U.S.A.

CHEMICAL

United States

2,489,340. **Vulcanizing Natural and Synthetic Rubber in the Presence of Sulfur, an Accelerator, and a Compound of the Group of the Trichloromethyl Aryl Compounds of the Benzene and Naphthalene Series.** B. M. Sturgis, Pitman, N. J., and A. A. Baum, assignors to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,489,366. **Resinous Materials Obtained by Heating together a Polyamine with an Aldehydo Non-Aromatic Carboxylic Acid.** H. A. Bruson, Rydal, and W. D. Niederhauser, assignors, by mesne assignments, to Rohm & Haas Co., both of Philadelphia, both in Pa.

2,489,407. **Method of Lining Container Closures Including the Deposition of a Plastic Resin Composition Which Will Form a Rubbery Gel on Being Heated and Subsequently Cooled.** A. B. Foye, West Bridgewater, assignor to Dewey & Almy Chemical Co., Cambridge, both in Mass.

2,489,518. **Vinyl Chloride Resin Heat-Stabilized with a Dialkyl Tin Dialcoholate of a Monohydroxyl Compound Containing at Least One Carbon to Carbon Double-Bond and at Least 3 Carbon Atoms.** S. L. Burt, Plainfield, N. J., assignor to Bakelite Corp., a corporation of N. J.

2,489,537. **Dyeing Vinyl Chloride Fibers with Basic Dyes.** H. T. Neumann, New York, N. Y., assignor on one-half to L. G. Arpin, Montclair, N. J.

2,489,674. **Vinyl Resin Composition Including a Thiophene Polymer of Molecular Weight 200 to 500.** E. P. Rittershausen, Hempstead, N. Y., assignor to Socony-Vacuum Oil Co., Inc., a corporation of N. Y.

2,489,704. **As Accelerator of Vulcanization, a Composition Including a Powdered Arylthiazyldisulfide Having Admixed therewith a Light Mineral Oil and a Zinc Soap of the Aliphatic Acids of 8-22 Carbon Acids, or Mixtures thereof.** A. R. Davis, Riverside, Conn., assignor to American Cyanamid Co., New York, N. Y.

2,489,711. **Rubber-Like Product Obtained by Heating an Omega-Hydroxy Saturated Aliphatic Carboxylic Acid with a Glycol Acid Ester of an Alpha, Beta-Unsaturated Dicarboxylic Acid and Curing the Reaction Product by Heating in the Presence of an Organic Peroxide Catalyst.** D. W. Jayne, Jr., Old Greenwich, and H. M. Day, Cos Cob, both in Conn., assignors to American Cyanamid Co., New York, N. Y.

2,489,943. **Polymeric Ester of 2-Ethylhexanediol-1,3 and Sulfosuccinic Acid Reaction Product of an Alkali Bisulfit and a Polymeric Maleic-Half Ester of 2-Ethylhexanediol-1,3 Alkyd Resin.** T. L. Wilson, Upper Montclair, and J. A. Davison, Waldwick, both in N. J., assignors to United States Rubber Co., New York, N. Y.

2,489,959. **Emulsion Polymerization of Styrene with an Ethylenically Unsaturated Monomer in Contact with an Ionizable Emulsifying Agent and Ammonium Persulfate, Then Adding the Hydroxide of Barium, Strontium, or Calcium, or the Hydrates thereof.** R. I. Dunlap, Springfield, Mass., assignor to Monsanto Chemical Co., St. Louis, Mo.

2,490,148. **Thermoplastic Composition Yielding Products of High Impact Strength and Hardness, Including Ethyl Cellulose Plasticized with Refined Mineral Oil and Liquid Partially Hydrogenated Mixed Isomeric Terphenyls.** W. P. Moeller, Baldwin, N. Y., and J. H. Prichard, Springfield, N. J., assignors to Celanese Corp. of America, a corporation of Del.

2,490,247. **An Alkali-Resistant Floor Tile Composition Including Polyvinyl Chloride or Polyvinyl Acetate-Chloride, a Filler, and a Plasticizer at Least about 15% of which Is a Rosin Acid Nitrile.** L. O. Amberg, assignor to Hercules Powder Co., Wilmington, Del.

2,490,264. **Rust Preventing Composition Including Mineral Oil, an Oil Soluble Petroleum Metal Sulfonate, and a Copolymer of Butadiene and Diisobutylene Having a Molecular Weight of 3,000 to 5,000.** J. D. Garber, Cranford, N. J., assignor to Standard Oil Development Co., a corporation of Del.

2,490,270. **Resin Obtained by Reacting a Thiohene with Turentine in the Presence of a Friedel-Crafts-Type Catalyst.** G. C. Johnson, Woodbury, N. J., assignor to Socony-Vacuum Oil Co., Inc., a corporation of N. Y.

2,490,357. **Preparation of Diorganosiloxane Polymers.** J. F. Hyde, assignor to Corning Glass Works, both of Corning, N. Y.

2,490,372. **Preparation of Polymeric Materials from Isopropenyl Toluene.** A. S. Nyquist, Cos Cob, and E. L. Kropa, Old Greenwich, both in Conn., assignors to American Cyanamid Co., New York, N. Y.

2,490,489. **Copolymerization of Maleic Anhydride and Styrene.** E. J. Tauch, Cleveland Heights, O., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,490,518. **Vulcanizing a Copolymer of Butadiene and a Mono Vinyl Compound in the Absence of Sulfur, with an N-thio Amine.** J. F. Hand, Hudson, O., assignor to Monsanto Chemical Co., St. Louis, Mo.

2,490,536. **Moistureproof Heat-Sealing Lacquer for Paper, Cellulose, and the Like, Including Chlorinated Rubber, a Copolymer of Ethylene and Vinyl Acetate, and a Wax.** C. G. Murphy, Raritan Township, N. J., and J. P. Sermattei, assignors to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,490,550 **Moistureproof Heat-Sealing Composition Including a Copolymer of Ethylene and Vinyl Acetate, a Hard Brittle Thermoplastic Resin, and a Wax.** J. P. Sermattei, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,490,567. **Preparation of Polypentaerythritols.** J. A. Wyler, assignor to Trojan Powder Co., both of Allentown, Pa.

2,490,626. **Composition Including a Natural or Synthetic Rubber, and a Gel Containing a Synthetic Resin and a Blown Product of an Organic Condensation Product of Formaldehyde and a Terpene or Terpene Alcohol.** M. T. Harvey, South Orange, N. J., assignor to Harvel Research Corp., a corporation of N. J.

2,490,691. **Alkyl Polysilicates.** C. M. Langkammerer, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,490,712. **Polymerization of Butadiene and Styrene in Aqueous Emulsion in the Presence of a Soap Emulsion, Potassium Persulfate as Polymerization Catalyst, and an Aliphatic Monohydric Saturated Alcohol.** W. A. Schulze and W. W. Crouch, both of Bartlesville, Okla., assignors to Phillips Petroleum Co., a corporation of Del.

2,490,753. **2-Trifluoromethyl-1,3-Butadiene.** H. M. Hill and E. B. Towne, assignors to Eastman Kodak Co., all of Rochester, N. Y.

2,490,875. **Phenyl Vinyl Sulfides.** E. F. Landau, Newark, and E. P. Irany, Cranford, both in N. J., assignors to Celanese Corp. of America, a corporation of Del.

2,490,927. **Water Soluble Resinous Product Produced by the Condensation of Resorcinol with Formaldehyde.** R. J. Spahr and D. J. Lieb, Bainbridge, assignors to Borden Co., New York, both in N. Y.

2,490,984-985. **Beta Mercapto Thioethers.** H. R. Snyder, Urbana, Ill., and J. M. Stewart, Berkeley, Calif., assignors to Phillips Petroleum Co., a corporation of Del.

2,491,102. **Flexible Shaped Articles Including a Gelatinized Polyvinylchloride Composition and a Resinous Interpolymer of a Methacrylate Ester of a Saturated Aliphatic Alcohol and Methacrylamide.** S. C. Frowde, Denton, Manchester, England, assignor to Imperial Chemical Industries, Ltd., a corporation of Great Britain.

2,491,350. **Preparation of Purified Polyesters of the Polycarboxylic Acid-Glycol Type.** D. W. Young, Roselle, and W. J. Sparks, Cranford, both in N. J., assignors to Standard Oil Development Co., a corporation of Del.

2,491,409. **Copolymer of Unsaturated Fumarate Alkyd Resin.** E. L. Kropa, Old Greenwich, and A. S. Nyquist, Cos Cob, both in Conn., assignors to American Cyanamid Co., New York, N. Y.

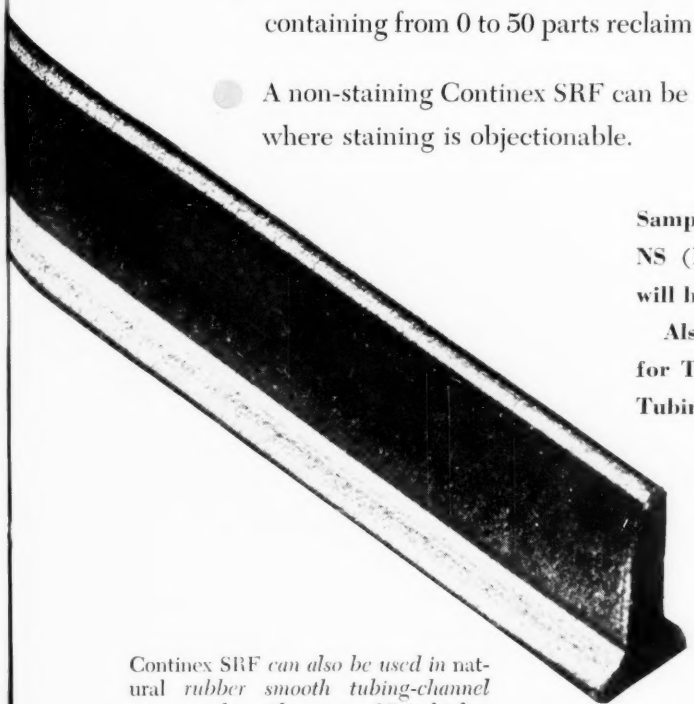
2,491,433. **Interpolymer of Butadiene, Acrylonitrile, and Hexadiene.** W. D. Wolfe, Cuyahoga Falls, assignor to Wingfoot Corp., Akron, both in O.

2,491,433-444. **Color Stabilization of Vinyl**

points of interest

ABOUT "COLD RUBBER" AND CONTINEX SRF

- Approximately 35% higher loadings of Continex SRF, as used for the smooth tubing shown in the illustration, can be achieved more economically and with no sacrifice in processing safety and speed.
- Continex SRF in "Cold Rubber" enables the production of smooth tubing-channel compounds having minimum radial swell heretofore impossible with GR-S.
- Satisfactory compounds similar to the illustration can be produced containing from 0 to 50 parts reclaim per 100 parts "Cold Rubber."
- A non-staining Continex SRF can be supplied for specialty items where staining is objectionable.



Samples of Continex SRF and Continex SRF-NS (Non-staining), as well as formulations, will be supplied on request.

Also, for more complete information, write for Technical Service Report CB-3 "Smooth Tubing *Cold Rubber* Channel Compounds."

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Halide Resins. F. W. Cox, Birmingham, Ala., and J. M. Wallace, Jr., assignors to Wingfoot Corp., both of Akron, O.

2,491,455-456. **Polyvinyl Formal Resin Plasticized with a Dialkyl Ester or a Dialkoxyethyl of a Phthalic Acid.** W. R. Richard, Ann Arbor, Mich., assignor to Monsanto Chemical Co., St. Louis, Mo.

2,491,471. **Acrylonitrile-Vinylpyridine Copolymers.** H. W. Arnold, Claymont, assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, both in Del.

2,491,472. **Polymerizing in Aqueous Solution a Salt of a Monomeric Vinylpyridine with an Acid Having a Dissociation Constant of at Least 1.49 x 10^{-4}.** J. Harmon, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,491,477. **Adhesive Cement Consisting Essentially of a Compounded Base Containing Chiefly a Butadiene-Acrylonitrile Copolymer, and a Resinous Ester, Aldol-Alpha-Naphthylamine, and a Volatile Vehicle to Make the Cement Spreadable.** E. M. Chmiel, Detroit, Mich., assignor to Minnesota Mining & Mfg. Co., St. Paul, Minn.

2,491,509. **Preparation of 2-Mercapto-3-Arylpyrimidines by Reacting an Alpha, Beta-Unsaturated Ketone, a Salt of Thiocyanic Acid, and a Primary Aromatic Amine in the Presence of a Strong Non-Oxidizing Acid.** R. A. Mathes and F. D. Stewart, Akron, O., assignors to B. F. Goodrich Co., New York, N. Y.

2,491,519. **Coagulation of Butadiene-Acrylonitrile Copolymers.** H. J. Rose and L. C. Price, both of Baton Rouge, La., assignors to Standard Oil Development Co., a corporation of Del.

2,491,525. **Self-Supporting Film of Styrene-Isobutylene Copolymer.** W. J. Sparks, Cranford, and D. W. Young, Roselle, both in N. J., assignors to Standard Oil Development Co., a corporation of Del.

2,491,526. **Composition Including a Major Proportion of a Styrene-Isobutylene Copolymer and Admixed therewith, Zinc Stearate or Zinc Dilinoleate.** W. J. Sparks, Cranford, and D. W. Young, Roselle, both in N. J., assignors to Standard Oil Development Co., a corporation of Del.

2,491,580. **Preparation of Organic Isocyanates.** S. T. Putnam, Newark, assignor to Hercules Powder Co., Wilmington, both in Del.

2,491,584. **For Shrinkproofing Wool, an Aqueous Emulsion Containing a Copolymer of Butadiene and an Unsaturated Ketone, a Water-Soluble Neutral Salt of an Alkali Metal as Conditioning Agent, and a Non-Cationic Emulsifying Agent.** J. B. Rust, Montclair, N. J., assignor to Montclair Research Corp., a corporation of N. J.

2,491,642. **Casting Solution Consisting of Polyvinyl Alcohol, Water, and as Agent to Facilitate Stripping from a Metal Casting Surface, a Polyethylene Oxide.** G. W. Brant, Buffalo, N. Y., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,491,709. **Preparation of Rubber and Plastics in Cellular Form with the Aid of Dinitrosoamino Compounds.** A. S. Briggs and G. E. Scharff, Blackley, Manchester, England, assignors to Imperial Chemical Industries, Ltd., a corporation of Great Britain.

2,491,710. **Low-Temperature Polymerization of Isobutylene.** J. D. Calfee, Westfield, R. M. Thomas, Union, and P. J. Flory, Cranford, all in N. J., assignors to Standard Oil Development Co., a corporation of Del.

2,491,752. **Preparing Linear Polymers from Isobutylene and a Diolefin Having 4 to 6 Carbon Atoms.** J. E. Moise, Baton Rouge, La., assignor to Standard Oil Development Co., a corporation of Del.

2,491,811. **Coating Composition Including a Mixture of a Preformed Modified Tetrachlorophthalate Alkyd Resin and Ethyl Cellulose in a Suitable Solvent.** P. W. Ham, Schenectady, N. Y., assignor to General Electric Co., a corporation of N. Y.

2,491,833. **Hydrocarbon-Substituted Silyl Methane Compounds.** R. O. Sauer, Schenectady, N. Y., assignor to General Electric Co., a corporation of N. Y.

2,491,851. **Synthetic Resin Made by Heating together Unsaturated Fatty Oil, Sulfur, and Quinoline or Pyridine.** P. Caccia, assignor of one-half to M. Di Girolamo, both of Cincinnati, O.

2,491,913. **Synthetic Rubber Compositions Containing Unsubstituted Rosin Amines.** L. O. Amberg, assignor to Hercules Powder Co., both of Wilmington, Del.

2,491,923. **For Making Bookbinding Materials, a Composition Including Polyvinyl Chloride, Polypropylene Glycol Sebacate, and Solvent, and a Further Surface Composition Including Polyvinyl Chloride, Silica Gel, and Solvent.** C. C. Johnson, Newburgh, N. Y., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

2,491,924. **Polyamide Composition Including a Polyamide Resin and a Hydroxy Substituted Diphenyl Sulfone.** R. H. Schlattman, Richmond Heights, assignor to Monsanto Chemical Co., St. Louis, both in Mo.

2,491,935. **Polyamide Composition Including Orthosulfobenzimide and a Polyamide Resin.** R. H. Schlattman, Richmond Heights, assignor to Monsanto Chemical Co., St. Louis, both in Mo.

2,491,936. **Polyamide Composition Including a Mixture of N-ethyl o,p-Toluene-Sulfonamide and Orthosulfobenzimide, and a Polyamide Resin.** R. H. Schlattman, Richmond Heights, assignor to Monsanto Chemical Co., St. Louis, both in Mo.

2,492,086-087. **In the Preparation of Granular Copolymers of Vinyl Chloride and Diethyl Maleate, and of Vinyl Chloride and Vinyl Acetate, the Incorporation of Glyceryl Mono-Octadecanoate.** M. Baer, Springfield, Mass., assignor to Monsanto Chemical Co., St. Louis, Mo.

2,492,088-089. **In the Preparation of Granular Copolymers of Vinyl Chloride and Diethyl Maleate, and of Vinyl Chloride and Vinyl Acetate, the Incorporation of 12-Hydroxy Octadecanoic Acid.** M. Baer, Springfield, Mass., assignor to Monsanto Chemical Co., St. Louis, Mo.

2,492,124. **Film Casting Composition of an Aqueous Colloidal Solution of a Polymer of a Monovinyl Aromatic Compound and Butadiene or Isoprene, and a Drying Oil.** A. E. Young and E. K. Stilbert, assignors to Dow Chemical Co., all of Midland, Mich.

2,492,129. **Preparing a Solid, Elastic Durable Methyl-Substituted Polysiloxane.** M. M. Sprung, Scotia, N. Y., assignor to General Electric Co., a corporation of New York.

2,492,146. **Refining Polymerized Rosin.** B. L. Hampton, Jacksonville, Fla., assignor, by mesne assignments, to Glidden Co., Cleveland, O.

2,492,169. **Synthetic Rubber-Like Materials from an Alkyl Acrylate and Divinyl Ether, Diallyl Ether, or Dimethallyl Ether.** W. C. Mast and L. T. Smith, both of Philadelphia, and C. H. Fisher, Abington, both in Pa., assignors to The United States of America, as represented by the Secretary of Agriculture.

2,492,170. **Synthetic Rubber-Like Materials from an Alkyl Acrylate and a Haloalkyl Acrylate.** W. C. Mast, Philadelphia, C. E. Rehberg, Glenside, and C. H. Fisher, Abington, all in Pa., assignors to United States of America, as represented by the Secretary of Agriculture.

2,492,203. **Methacrylic Ester of a Carbohydrate.** R. H. Treadway, Wyndmoor, Pa., assignor to The United States of America, as represented by the Secretary of Agriculture.

2,492,419-420. **Plasticized Copolymers of Vinyl Chloride with Acrylonitrile.** C. W. Gayler, Ridley Park, Pa., assignor to American Viscose Corp., Wilmington, Del.

2,492,512. **Thermoplastic Coating Composition Including a Polyvinyl Acetal, Hydrogenated Castor Oil, and Castor Oil.** S. Zweig, assignor to Milprint, Inc., both of Milwaukee, Wis.

2,492,622. **Continuous Process for Preparing Halothiophenes** H. L. Coonradt, Woodbury, N. J., assignor to Socony-Vacuum Oil Co., Inc., a corporation of N. Y.

2,492,623-624. **Preparation of Trichlorothiophene and Tetrachlorophene.** H. L. Coonradt, Woodbury, and H. D. Hartough, Pitman, both in N. J., assignors to Socony-Vacuum Oil Co., Inc., a corporation of N. Y.

2,492,645. **Thiophenecarboxylic Acid.** G. C. Johnson, Woodbury, and J. W. Schick, Camden, both in N. J., assignors to Socony-Vacuum Oil Co., Inc., a corporation of N. Y.

2,492,477. **Resins from Tar Acids, Formaldehyde and Oils Obtained from Coal-Tar Distillates.** H. L. Allen, Philadelphia, Pa., and E. G. Kerr, Haddonfield, N. J., assignors to Allied Chemical & Dye Corp., New York, N. Y.

2,492,844. **Decomposition of Polymeric Material.** F. E. Condon, Bartlesville, Okla., assignor to Phillips Petroleum Co., a corporation of Del.

2,492,855. **Thermosetting Polyaryl-Biguanide-Fromaldehyde Resins.** A. L. Fox and H. L. Sanders, both of Easton, Pa., and R. T. Olsen, Phillipsburg, N. J., assignors to General Aniline & Film Corp., New York, N. Y.

2,492,929. **Polymerization of a Vinyl Ester of a Carboxylic Acid, While Dissolved in Dioxane, Tetrahydrofuran, or Tetrahydropyran, in the Presence of a Peroxygen Compound Catalyst.** W. R. Cornthwaite, assignor to E. I. du Pont de Nemours & Co., Inc., both of Wilmington, Del.

2,492,930. **Emulsion Polymerization of an Unsaturated Organic Compound with a Water-Soluble Salt of an Amine of the Group of Hydroalbietylamine and Dehydroabietylamine as Emulsifying Agent.** A. E. Drake, Hockessin, assignor to Hercules Powder Co., Wilmington, both in Del.

Dominion of Canada

460,689. **Resin from Furfuryl Alcohol and Formic Acid.** W. C. Tobie, Washington, D. C., assignor to American Cyanamid Co., New York, N. Y., both in the U.S.A.

460,690. **Acrylonitrile Stabilized with Ammonia, Ammonium Carbonate or Products Resulting from the Reaction of Ammonia with Acrylonitrile.** H. S. Davis, Greenwich, and O. F. Wiedeman, Old Greenwich, both in Conn., assignors to American Cyanamid Co., New York, N. Y., U.S.A.

460,705. **Resolution of Azeotropic Mixtures of Chlorosilanes.** R. O. Sauer, Schenectady, N. Y., U.S.A., assignor to Canadian General Electric Co., Ltd., Toronto, Ont.

460,707. **Preparation of Organosilicon Halides.** E. G. Rochow and W. F. Gilliam, Schenectady, N. Y., U.S.A., assignors to Canadian General Electric Co., Ltd., Toronto, Ont.

460,735. **Modifying the Polymerization of Butadiene-1,3 Hydrocarbons in Aqueous Emulsion, Including Continuously Adding to the Emulsion an Aliphatic Mercaptan Having from 4 to 16 Carbon Atoms.** B. M. G. Zwicker, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y., both in the U.S.A.

460,736. **Polymerization of Butadiene-1,3 Hydrocarbons in Aqueous Emulsion in the Presence of a Polyhydric Alcohol.** W. D. Stewart, Yonkers, assignor to B. F. Goodrich Co., New York, both in N. Y.

460,737. **Modified Alkyd Resin Which Is the Reaction Product of a Polymerized Rosin, a Polycarboxylic Acid and a Polyhydric Alcohol.** E. G. Peterson, assignor to Hercules Powder Co., both of Wilmington, Del., U.S.A.

460,783. **Polymeric Diallyl Diglycolate.** D. E. Adelson and H. Dannenberg, Berkeley, assignors to Shell Development Co., San Francisco, both in Calif., U.S.A.

460,865. **Isobutylene.** L. N. Leum, Upper Darby, and F. G. Ciapetta, Yeadon, assignors to Atlantic Refining Co., Philadelphia, all in Pa., U.S.A.

460,876. **Dimethyl Silicone Products.** J. G. E. Wright, Schenectady, N. Y., U.S.A., assignor to Canadian General Electric Co., Ltd., Toronto, Ont.

460,878. **Polysiloxane Resin.** C. E. Welsh, Schenectady, N. Y., U.S.A., assignor to Canadian General Electric Co., Ltd., Toronto, Ont.

460,880-881. **Making Butadiene.** I. L. Murray, Charleston, J. L. Marsh, South Charleston, both in W. Va., and S. P. Smith, Jr., Louisville, Ky., both in the U.S.A., assignors to Carbide & Carbon Chemicals, Ltd., Toronto, Ont.

460,882. **Cyclic Process for Making Butadiene.** J. L. Marsh, Scarsdale, N. Y., and M. E. Hitchcock, South Charleston, W. Va., both in the U.S.A., assignors to Carbide & Carbon Chemicals, Ltd., Toronto, Ont.

460,883. **Cyclic Process for Making Butadiene.** H. D. Kinsey and P. J. Ferrara, both of Oak Ridge, Tenn., and T. H. Kelly, Charleston, W. Va., both in the U.S.A., assignors to Carbide & Carbon Chemicals, Ltd., Toronto, Ont.

460,893. **Vulcanizing Rubber Composition in the Presence of an S-Thiocarbamyl N-Disubstituted Thiohydroxylamine.** P. T. Paul and B. A. Hunter, Naugatuck, Conn., U.S.A., assignors to Dominion Rubber Co., Ltd., Montreal, P.Q.

460,895. **Polymerization of Methyl Alpha-Chloroacrylate.** R. A. Jacobson, Landenberg, Pa., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., U.S.A.

460,897. **Insolubilizing Hydrolyzed Ethylene/Vinyl Ester Polymers.** W. L. Alderson, Jr., Wilmington, Del., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington.

460,947. **A Copolymer of not More Than 30% of a 1,3-Diene of 4 to 5 Carbon Atoms with at Least about 70% of a Branch-Chain 1,3-Hexadiene Having a Straight Chain of 5 Carbon Atoms.** E. T. Bishop, Berkeley, assignor to Shell Development Co., San Francisco, both in Calif., U.S.A.

460,954. **Thermosetting Synthetic Resin Coating for a Remoistenable Adhesive.** H. H. Young and D. F. Holloway, assignors to Swift & Co., all of Chicago, Ill., U.S.A.

461,033. **Vulcanizable Natural or Synthetic Rubber Composition Including, as Accelerator, an Amorphous Reaction Product Prepared by Fusing Benzothiazyl Disulfide with a Diarylguanidine.** A. R. Davis, Riverside, Conn., assignor to American Cyanamid Co., New York, N. Y., U.S.A.

461,036. **Vulcanizable Composition Including a Mixture of an Elastoprene and a Salt of 2,6-Dimercapto-Benzo(1,2,4,5,) Bisthiazole.** M. L. Dolt, Plainfield, N. J., and R. E. Sayre, Stamford, Conn., assignors to American Cyanamid Co., New York, N. Y., all in the U.S.A.

461,048. **Processing Soluble Dimethyl Silicone Elastic Products Prepared by the Use of Ferric Chloride.** D. W. Scott, Schenectady, N. Y., U.S.A., assignor to Canadian General Electric Co., Ltd., Toronto, Ont.

461,062. **Preparation of Dialkenyl Sulfides by Reacting an Olefinic Hydrocarbon with Elemental Sulfur in the Presence of Metal in Combination, this Metal Is from the Magnesium-Zinc Family of Elements of the Periodic Table; and a Nitrogen-Containing Compound of the Class of Vulcanization Accelerators for Rubber.** R. T. Armstrong, Johnson City, Tenn., U.S.A., assignor to Dominion Rubber Co., Ltd., Montreal, P.Q.

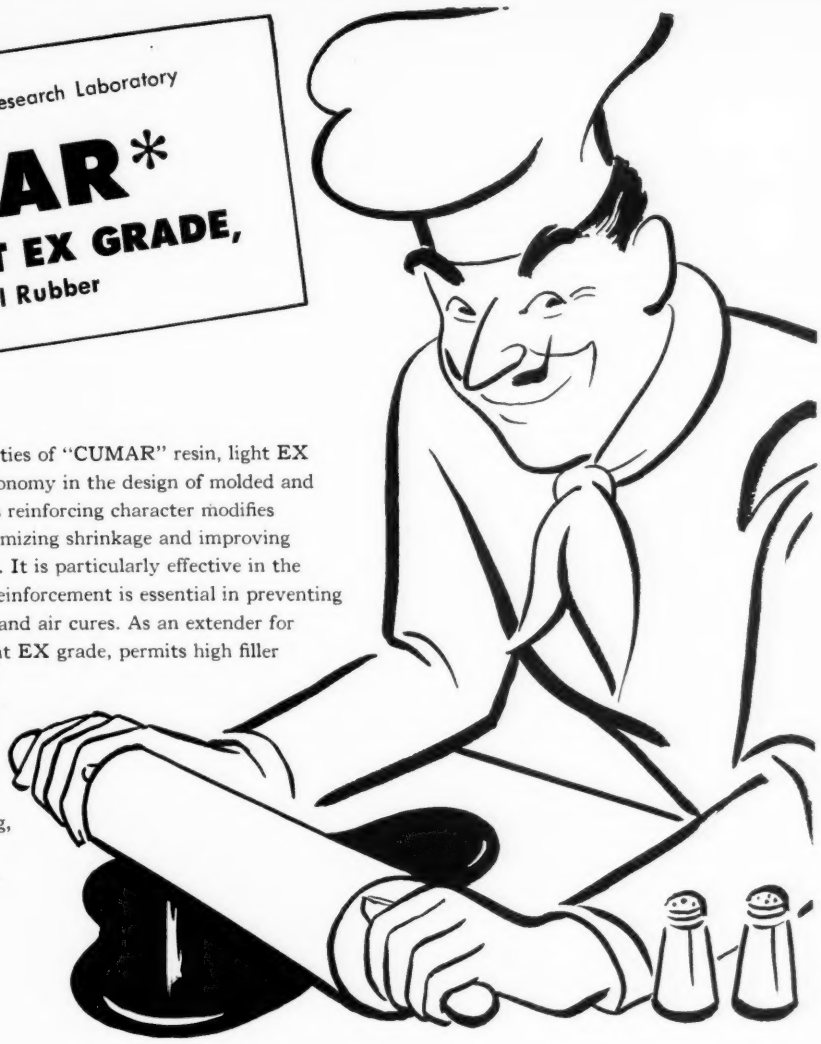
RECIPE

from the Barrett Rubber Research Laboratory
FOR

CUMAR*

RESIN, LIGHT EX GRADE,

in Natural Rubber



The reinforcing and extending properties of "CUMAR" resin, light EX grade, promote quality along with economy in the design of molded and extruded natural rubber products. Its reinforcing character modifies the nerve of the rubber, thereby minimizing shrinkage and improving processing and calendering properties. It is particularly effective in the production of extruded items where reinforcement is essential in preventing sagging and flattening in open steam and air cures. As an extender for natural rubber, "CUMAR" resin, light EX grade, permits high filler loading while maintaining quality. It is especially useful for improving tear resistance. Its application is in automotive and aeronautical parts, mechanical and proofed goods, footwear, soles and heels, flooring, matting, bumper and channel stocks, and in items which are to be used in contact with dark colored enamels and lacquers.

RECIPE

Smoked Sheets	100.00
CUMAR* Resin, Light EX Grade	15.00
"DIXIE" Clay	75.00
Calcium Carbonate (Precipitated)	75.00
"SILENE" EF	25.00
Zinc Oxide	5.00
Stearic Acid	2.00
"AGERITE" Alba	1.00
Paraffin	1.00
Red Oxide	5.00
Sulfur	3.75
Benzothiazyl Disulfide	1.25
DOTG	0.40
Total	**309.40**

Specific Gravity	1.55
Rubber Hydrocarbon, % by weight	32.4
Rubber Hydrocarbon, % by volume	54.4
Mooney Viscosity, ML, 4 min. @ 212 F.	54

Scorch Test: Press Cures @ 250 F.

Minutes	Cure
5	None
10	None
15	Slight
20	Fair

Press Cure at 316 F. (70 lb.)—10 Minutes:	Unaged	Aged 24 hrs. @ 100 C.
Tension and Hardness Data		
Stress, 300%, Psi.	900	1000
Tensile, Psi.	1600	1250
Elongation, %	510	420
Hardness, Shore A	78	81
Tear Resistance, Angle, Pounds Per One Inch Thickness	135	145
Press Cure at 316 F. (70 lb.)—15 Minutes:		
Abrasion Resistance, Du Pont	375	340
Compression Set, 25% Constant Deflection, %	52.6	—
Resilience, Yerzley, 20% Deformation, %	45	36
Rebound, Goodyear-Healey, %	51.0	47.3
Contact Stain (24 Hours @ 175 ± 2 F.)	Slight	
Migration Stain (24 Hours @ 125 ± 2 F.)	Slight	

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

Barrett*

*Reg. U. S. Pat. Off.

461,063. **In the Polymerization of Ethylene, the Step of Carrying out the Reaction in an Aqueous Menstruum, at a pH of 7-11, in the Presence of an Alkali Persulfate Catalyst.** R. E. Brooks and A. G. Weber, Wilmington, and M. D. Peterson, Edgemore Terrace, both in Del., U.S.A., assignors to Canadian Industries, Ltd., Montreal, P.Q., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington.

461,066. **Polymerization of Ethylene, Which Includes Introducing into a Reaction Zone Ethylene and Water Containing Dissolved Oxygen and Subjecting the Ethylene to a Temperature of 100° to 400° C. and Pressure of 500 to 1500 Atmospheres.** N. W. Krase, Swarthmore, Pa., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., U.S.A.

461,067. **In the Preparation of High Molecular Weight Products from Ethylene with Oxygen as the Catalyst, the Step of Conducting the Reaction While Maintaining the Product Formed in the Vapor Phase throughout the Reaction.** A. T. Larson, Wilmington, Del., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington.

461,070. **Light Stable Resin Including Polystyrene and up to 5% of 1,2-Epoxy Compound.** B. W. Howk, Wilmington, Del., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington.

461,071. **Composition Including a Blend of a Phenol-Rubber and a Heat-Convertible Resorcinol-Formaldehyde Resole.** H. E. Schroeder, Wilmington, Del., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington.

461,075. **Stabilization of Polyvinyl Acetal Resins.** G. S. Stamatoff, Nutley, N. J., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., U.S.A.

461,076. **Composition Including Solid Ethylene Homopolymer and a Compound from the Group of Diphenylol Propane and Diresylol Propane.** G. H. Latham and D. E. Strain, both of Wilmington, Del., U.S.A., assignors to Canadian Industries, Ltd., Montreal, P.Q., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., U.S.A.

461,079. **Sulfurized Terpene.** L. C. Holt, Gilpin's Point, Md., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., U.S.A.

461,080. **Preparation of a Soluble, Fusible Polymer of Crotyl Methacrylate.** H. C. Miller, Claymont, assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, both in Del., U.S.A.

461,085. **Polymerizing N-Vinyl Pyrrole Compounds.** W. Freudenberg, Cranford, N. J., assignor to General Aniline & Film Corp., New York, N. Y., U.S.A.

461,102. **Polymerization of Vinyl Organic Esters in Aqueous Medium and in the Presence of a Water Soluble Persulfate and a Water-Soluble Salt of an Oxyacid of Sulfur with Reducing Properties.** R. G. R. Bacon, Rowland Hill, and J. R. Lewis, Blackley, both in England, assignors to Canadian Industries, Ltd., Montreal, P.Q., assignor to Imperial Chemical Industries, Ltd., London, England.

461,105. **Subjecting Unsymmetrical Dichloroethylene to Polymerization in Aqueous Medium in the Presence of a Water-Soluble Persulfate and a Water-Soluble Thiosulfate.** R. G. R. Bacon, J. R. Lewis, and L. B. Morgan, all of Blackley, England, assignors to Canadian Industries, Ltd., Montreal, P.Q., assignor to Imperial Chemical Industries, Ltd., London, England.

461,106. **Polymerization of Acrylic Acid and Derivatives thereof.** R. G. R. Bacon, S. G. Jarrett, and L. B. Morgan, all of Blackley, England, assignors to Canadian Industries, Ltd., Montreal, P.Q., assignor to Imperial Chemical Industries Ltd., London, England.

461,108. **Embrittling Polythene by Mixing with Methylated Spirits and Reducing the Resultant Mixture to Powder Mechanically.** K. B. Jarrett, Welwyn Garden City, England, assignor to Canadian Industries, Ltd., Montreal, P.Q., assignor to Imperial Chemical Industries, Ltd., London, England.

461,109. **Polymerization of Ethylene in Presence of Ethers.** J. S. A. Forsyth, Norwich, England, assignor to Canadian Industries, Ltd., Montreal, P.Q., assignor to Imperial Chemical Industries, Ltd., London, England.

461,112. **Polymers of Alpha-Acetaminoacrylic Acid Esters.** E. Isaacs and H. Gugeon, both of Blackley, England, assignors to Canadian Industries, Ltd., Montreal, P.Q., assignor to Imperial Chemical Industries, Ltd., London, England.

461,113. **Flameproofing Cellulosic Material by Impregnating with a Polyethyleneimine and Then Treating with an Aqueous Solution of Dipentaerythritol Hexaorthophosphate.** A. McLean, West Kilbride, and S. F. Marrian, Ardrossan, both in Ayrshire, Scotland, assignors to Canadian Industries, Ltd., Montreal, P.Q., assignor to Imperial Chemical Industries, Ltd., London, England.

461,148. **Vinyl Chloride.** H. A. Cheney, Berkeley, assignor to Shell Development Co., San Francisco, both in Calif., U.S.A.

461,152. **Production of Diolefins from Olefins and Aldehydes.** N. H. Marsh, Baytown, Tex., assignor to Standard Oil Development Co., Linden, N. J., both in the U.S.A.

461,153. **Diolefins.** W. D. Seyfried, Wooster, Tex., assignor to Standard Oil Development Co., Linden, N. J., both in the U.S.A.

461,170. **Producing the Alkali Hydroxylate of an Aryl Aldehyde.** A. F. Hardman, assignor to Wingfoot Corp., both of Akron, O., U.S.A.

461,171. **Copolymer of Styrene of Acrylonitrile and Butadiene-1,3 and a Conjugated Aliphatic Olefinic Hydrocarbon Containing 8 to 12 Carbon Atoms.** C. E. Boord, Columbus, assignor to Wingfoot Corp., Akron, both in O., U.S.A.

461,219. **Softener and Age Retardant for Compounding Elastomers, Including a Hydrocarbon Fraction Obtained by Distillation of Products Obtained in the Manufacture of Butadiene by the Non-Catalytic Low-Pressure, Vapor-Phase Cracking Process.** G. R. Lawson, Bronxville, assignor to Allied Chemical & Dye Corp., New York, both in N. Y., U.S.A.

461,229. **Incorporating an Oxide of Calcium or Magnesium in a Butadiene-Styrene Copolymer Compound to Reduce Cut-Growth Rate.** A. R. Davis, Riverside, Conn., assignor to American Cyanamid Co., New York, N. Y., both in the U.S.A.

461,231. **Synthetic Resin from Ketone Condensation Products.** J. R. Dudley, Darien, Conn., assignor to American Cyanamid Co., New York, N. Y., both in the U.S.A.

461,260. **Preparation of Polyvinyl Chloride by Dispersing Vinyl Chloride in an Aqueous Continuous Phase Containing Both a Non-Buffering Water Soluble Salt or Salts of Strong Inorganic Acid and an Acid.** H. P. Staudinger, Ewell, and M. D. Cooke, Banstead, both in Surrey, England, assignors to Distillers Co., Ltd., Edinburgh, Scotland.

461,262. **Copolymerization of Vinyl Acetate and Methyl Methacrylate.** M. M. Brubaker, Boothwyn, and R. A. Jacobson, Landenberg, both in Pa., U.S.A., assignors to Canadian Industries, Ltd., Montreal, P.Q., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., U.S.A.

461,285. **Heat-Resistant Flexible Resin Coating for Sheet Material.** H. C. Brinker, assignor to Minnesota Mining & Mfg. Co., both of St. Paul, Minn., U.S.A.

461,302. **Polymerizing an Unsaturated Polyester of a Polycarboxylic Acid in the Presence of at Least Two Polymerization Catalysts.** E. C. Shokal, Oakland, and L. N. Whitehill and C. W. Schroeder, both of Berkeley, assignors to Shell Development Co., San Francisco, all in Calif., U.S.A.

461,342. **Copolymer of Divinyl Sulfide and Butadiene.** C. F. Winans, Edgewood, Pa., assignor to Wingfoot Corp., Akron, O., both in the U.S.A.

461,387. **As Bonding Agent for a Friction Element for Use on Vehicular Brakes, the Heat Reaction Product of a Mixture of Natural or Reclaimed Rubber or Butadiene Copolymers, a Vulcanizing Agent, a Heat-Reactive Phenolic-Aldehyde Resin, and Polymerized Cashew Nutshell Liquid.** R. E. Spokes, Ann Arbor, Mich., assignor to American Brake Shoe Co., New York, N. Y., both in the U.S.A.

461,388. **Rubber-Like Material Obtained by Copolymerizing an Aqueous Emulsion Containing Pentadiene-1,3 and Acrylonitrile or Pentadiene-1,3 and Styrene.** E. L. Kropa, Old Greenwich, Conn., assignor to American Cyanamid Co., New York, N. Y., both in the U.S.A.

461,392. **Piperazine.** H. F. Pfann, Aliquippa, Pa., and J. K. Dixon, Riverside, Conn., assignors to American Cyanamid Co., New York, N. Y., all in the U.S.A.

461,393. **Vulcanizing Rubber and Rubber-Like Materials in the Presence of Sulfur and a Powdered Resinous Fusion Product of Zinc Chloride, a Monoarylguanidine, Paraformaldehyde, and Mercaptobenzothiazole.** E. W. Cook, New York, N. Y. and E. O. Hook, Riverside, Conn., assignor to American Cyanamid Co., New York, both in the U.S.A.

461,425. **Nuclear Substituted Styrenes.** M. G. Sturrock and T. Lawe, assignors to Dominion Tar & Chemical Co., all of Montreal, P.Q.

461,427. **Obtaining Clear Films from Ethylene Polymers.** H. G. Ingersoll, Wilmington, Del., U.S.A., assignor to Canadian Industries, Ltd., Montreal, P.Q., assignor to E. I. du Pont de Nemours & Co., Inc., Wilmington.

461,502. **Thiophene.** R. C. Hanford, H. E. Rasmussen, and A. E. Sachanen, all of Woodbury, N. J., assignors to Socony-Vacuum Oil Co., Inc., New York, N. Y., both in the U.S.A.

461,504. **Cured Elastic Hydrocarbon Interpolymers of Isobutylene and a Polyolefin of 4 to 14 Carbon Atoms; the Curing Agent Contains an Aryl Ester of a Quinone Dioxime.** L. A. Mikeska, Wetfield, and H. E. Puc, Roselle, assignors to Standard Oil Development Co., Linden, all in N. J., U.S.A.

461,521-522. **Water-Soluble Phenol Formaldehyde Resin.** R. G. Booty, Elmwood Park, Ill., assignor to Weyerhauser Timber Co., Tacoma, Wash., both in the U.S.A.

461,576. **Separation of Styrene and Phenylacetylene by Fractionation with Ethylene Glycol Monomethyl Ether.** R. B. Greene, Philadelphia, Pa., assignor to Allied Chemical & Dye Corp., New York, N. Y., both in the U.S.A.

461,607. **Preparation of a Cellular Material from a Primary Thermosetting Resinous Condensation Product Mixed with a Thermoplastic Material.** A. Cooper and D. E. Partington, assignors to Expanded Rubber Co., Ltd., all of Croydon, Surrey, England.

461,609. **In the Emulsion Polymerization of a Butadiene and Styrene, the Use, as Emulsifying Agent, of a Soluble Salt of Myristic Acid, Methyl Alcohol, or Dioxane.** C. E. Barnes, Belvedere, N. J., assignor to General Aniline & Film Corp., New York, N. Y., both in the U.S.A.

461,633. **Copolymeric Material from Butadiene-1,3, Styrene, and Nuclear Dichlorostyrene.** M. C. Taylor, Niagara Falls, assignor to Mathieson Alkali Works, New York, both in N. Y., U.S.A.

461,634. **Synthetic Rubber-Like Reaction Product of the Copolymerization of Nuclear Chlorinated Styrene with a Mixture of Conjugated Diolefins Containing not Less Than 65 Mole % of a Single Conjugated Diolefin.** C. C. Clark, Kenmore, assignor to Mathieson Alkali Works, New York, both in N. Y., U.S.A.

461,643-644. **For Plasticizing Synthetic Rubber, the Use as Plasticizer of a Synthetic Rubber Latex Reacted with an Alkyl Mercaptan.** C. F. Fryling Phillips, Tex., assignor to Phillips Petroleum Co., Bartlesville, Okla., both in the U.S.A.

461,645. **As Plasticizer for Synthetic Rubber, the Reaction Product of a Solid Rubber-Like Polymer of a Conjugated Diolefin with an Alkyl Mercaptain.** J. E. Pritchard, Lafayette, Ind., assignor to Phillips Petroleum Co., Bartlesville, Okla., both in the U.S.A.

461,650. **Production of a Polyvinyl Acetal Resin Having a Residual Polyvinyl Alcohol Content of 9-30% by Weight.** G. O. Morrison, F. P. Lossing, A. H. Heatley, and J. F. L. M. Germain, Shawinigan Falls, assignors to Shawinigan Chemicals, Ltd., Montreal, both in P.Q.

461,656. **Gasoline Resistant Coatings Produced by Spreading on a Surface a Liquid Mixture of Organic Polysulfide Polymer and an Accelerator from the Group of Oxides and Peroxides of Copper, Manganese, Calcium, Magnesium and Zinc, and Exposing to the Action of a Promotor from the Group of Ammonia, Aliphatic Primary, Secondary, and Teriary Amines, Cyclic Amines, and Their Aqueous Solutions.** W. K. Schneider, assignor to Stoner-Mudge, Inc., both of Pittsburgh, Pa., U.S.A.

461,666. **Quick-Setting Tacky Cement from Purified Latex Ammonium Nitrate (as Sensitizing Agent), and Dimethylamine (as Stabilizer).** K. L. Keene and E. G. Bargmeyer, both of Mishawaka, Ind., assignors to United States Rubber Co., New York, N. Y., both in the U.S.A.

461,680. **Microporous Material from a Composition Including a Mixed Ester of Cellulose and Starch.** R. S. Locke and A. J. Daly, Spondon, England, assignors to Camille Dreyfus, New York, N. Y., U.S.A.

461,734. **Methyl Silicon Polymer.** R. R. McGregor, Verona, and E. L. Warrick, Pittsburgh, both in Pa., assignors to Corning Glass Works, Corning, N. Y., both in the U.S.A.

461,735. **Bis-Trimethylsilicyl Oxide.** W. H. Daudt, assignor to Corning Glass Works, both of Corning, N. Y., U.S.A.

461,744. **Granular Polyvinyl Ether.** C. E. Schildknecht, Easton, Pa., assignor to General Aniline & Film Corp., New York, N. Y., both in the U.S.A.

461,798. **Reacting Styrene and Unpolymerized Frosting Drying Oils by Heating in the Presence of a Monocyclic Alpha Terpene to Produce Soluble Styrene-Oil Interpolymers of a Non-Frosting Character.** R. H. Buckle, Birmingham, and E. Booth, London, executors of the estate of D. H. Hewitt, deceased, in his lifetime of London, co-inventor with L. E. Wakeford and R. R. Davidson, R. H. Buckle and E. Booth as such executors, assignors to Lewis Berger & Sons, Ltd., all of London, both in England.

461,846. **Granular Water-Insoluble Resinous Material from a Melamine-Formaldehyde Condensation Product Condensed in Water with a Guanidine Salt.** C. G. Laube, Stamford, Conn., assignor to American Cyanamid Co., New York, N. Y., both in the U.S.A.

461,847. **Polyarylbiguanide-Urea Resin in Wet Strength Paper.** J. R. Dudley, Darien, and J. A. Anthes, Springdale, both in Conn., assignor to American Cyanamid Co., New York, N. Y., both in the U.S.A.

461,848. **Production of Wet-Strength Cellulose Products with the Aid of a Colloidal So-**

A LOW COST BUNA N PLASTICIZER

PANAFLEX BN-1

EXCELLENT FOR *Light Colored* PRODUCTS!

PANAFLEX BN-1 is an economical, light-colored plasticizer for synthetic rubber — especially butadiene-acrylonitrile type.

This new hydrocarbon plasticizer *completely* replaces dibutyl phthalate in nitrile rubbers — produces soft vulcanizates having high tensile, excellent elongation, and very low modulus. **PANAFLEX BN-1** plasticized stocks possess good ageing properties, superior electrical characteristics, and show good gasoline and oil resistance.

SPECIFY GRAVITY	0.9440
COLOR, NPA	1½
REFRACTIVE INDEX	1.553
DISTILLATION, °F	560-730
ODOR	Excellent
VISCOSITY, SSU @ 100°F	240

SAMPLES ON REQUEST

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DIVISION
Pan American Refining Corp

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New York 17, N. Y.

PAN AMERICAN CHEMICALS

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78 GOODYEAR AVENUE
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Natural and Synthetic

Latex and Latex Compounds

for all purposes

lution of Cationic Melamine-Aldehyde Resin. C. S. Maxwell, Old Greenwich, and C. G. Landes, New Canaan, both in Conn., assignors to American Cyanamid Co., New York, N. Y., both in the U.S.A.

461,891. **Polymerizing Vinyl Ether by Contacting with a Friedel-Crafts-Type Catalyst in the Presence of Chloroform or Chlorobenzene.** F. Grosser, Easton, Pa., assignor to General Aniline & Film Corp., New York, N. Y., both in the U.S.A.

461,924. **Polymerizing Diallyl Phthalate in the Presence of Di(Tertiary Alkyl) Peroxide Catalyst.** W. E. Vaughan and F. F. Rust, Berkeley, assignors to Shell Development Co., San Francisco, both in Calif., U.S.A.

461,955. **Manufacture of Interpolymers of Styrene with Polyhydric Alcoholic Mixed Esters.** R. H. Buckle, Birmingham, and E. Booth, London, executors of the estate of D. H. Hewitt, deceased, in his lifetime of London, co-inventor of L. E. Wakeford and F. Armitage, assignors to Lewis Berger & Sons Ltd., all of London, both in England.

United Kingdom

631,200. **Condensation Products of Ureides and Formaldehyde.** Geigy Co., Ltd., H. Jones, and J. K. Aiken.

631,225. **Polymerization of Ethylenically Unsaturated Compounds.** E. I. du Pont de Nemours & Co., Inc.

631,272. **Recovery of Polymeric Materials.** Standard Oil Development Co.

631,341. **Copolymers of Styrene.** Standard Telephone & Cables, Ltd.

631,365. **Transparent Synthetic Resins.** Shell Refining & Marketing Co., Ltd., P. J. Garner, and R. E. Bowman.

631,372. **Protective Coatings of Polyvinyl Resin.** Bakelite, Ltd., C. E. Scoffom, and J. G. Weighall.

631,477. **Molding Compositions.** Dow Chemical Co.

631,479. **Synthetic Resinous Coating Compositions.** Monsanto Chemical Co.

631,493. **Preparation of Organo-Silicon Polymers.** Dow Chemical Co.

631,504. **Dispersions of Fluorine-Containing Polymers.** E. I. du Pont de Nemours & Co., Inc.

631,506. **Organosilicon Compounds.** Dow Corning Corp.

631,536. **Synthetic Resins.** J. G. Fife (Dow Corning Corp.).

631,544. **Interpolymers of a Styrene, an Allylic Fumarate, and an Allylic Alcohol.** United States Rubber Co.

631,570. **Suspensions of Tetrafluoroethylene Polymers.** E. I. du Pont de Nemours & Co., Inc.

631,590. **Synthetic Resins.** E. I. du Pont de Nemours & Co., Inc., D. D. Coffman, and H. W. Jacobson.

631,592. **Acrylamide.** American Cyanamid Co.

631,619. **Organo-Silicon Compounds.** Dow Corning Corp. and J. T. Goodwin, Jr.

631,804. **Artificial Semi-Conductors.** K. Rahbek.

631,844. **Polymerization of Polymerizable Materials.** E. I. du Pont de Nemours & Co., Inc.

631,909. **Stabilizers for Vinyl Resins.** United States Rubber Co.

631,917. **Molding Compositions Containing Acrylic Polymers.** S. R. Leader.

632,024. **Aqueous Dispersions of an Acid Reacting Synthetic Resin.** Monsanto Chemical Co.

632,051. **Compounding of Rubber or the Like.** Redfern's Rubber Works, Ltd., and F. E. Brown.

632,098. **Recovering a Stable Liquid Composition.** International Latex Processes, Ltd.

632,108. **Curing Synthetic Copolymers Containing Allylic Unsaturation.** United States Rubber Co.

632,114. **Plasticized Vinylidene Chloride Copolymers of the Organic Solvent Soluble Type.** British Cellophane, Ltd.

632,177. **Synthetic Resins.** Imperial Chemical Industries, Ltd., N. M. Beyts, J. M. J. De M. Estevez, and W. R. Davis.

632,192-195. **Catalytic Cracking of Petroleum Hydrocarbons.** Anglo-Iranian Oil Co., Ltd., J. N. Hare-Snape, and F. W. B. Porter.

632,211. **Electrical Insulating Materials.** Anglo-Iranian Oil Co., Ltd., D. A. Howes, and S. R. Pethrick.

632,256. **Electrically Conducting Films.** Libbey-Owens-Ford Glass Co.

632,270. **Stabilized Polythene Compositions.** E. I. du Pont de Nemours & Co., Inc.

632,316. **Solid Ethylene Polymer.** Standard Oil Co.

632,335. **Amino-Formaldehyde Resin Compositions Incorporating Latent Curing Agents.** British Industrial Plastics, Ltd.

632,555. **Molding Compositions.** F. and A. Bacci.

632,563. **Organo-Silicon Compounds.** Dow Corning Corp. and J. T. Goodwin, Jr.

632,661. **Preparation of Vinyl Pyridines.** E. I. du Pont de Nemours & Co., Inc., and L. F. Salisbury.

MACHINERY

United States

2,489,324. **Splicer.** I. J. Remark, assignor to General Tire & Rubber Co., both of Akron, O.

2,489,486. **Vertical Axis Tire Mold.** E. A. Glynn, assignor to Super Mold Corp., both of Lodi, Calif.

2,489,753. **Granular Molding Material Heater.** I. W. Cox, West Allis, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

2,489,951. **Extruder for Polyvinyl Acetal Resin Sheets Having Reduced Superficial Adhesion.** C. K. Bump, Hampden, Mass., assignor to Monsanto Chemical Co., St. Louis, Mo.

2,490,445. **Mechanism for Compacting Tire Carcasses on Tire Building Machines.** R. I. Kuffler, Detroit, Mich., assignor to General Tire & Rubber Co., Akron, O.

2,490,692. **Plastic Strip Material Splicer.** C. W. Leguillon, Akron, O., and P. Slusher, Carpintaria, Calif., assignors to B. F. Goodrich Co., New York, N. Y.

2,491,048. **Apparatus for Making Tubing from Thermoplastic Material.** W. L. Jenkins, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

2,491,282. **Apparatus for Making Vulcanizing Patches.** M. H. Rowe, Dallas, Tex.

2,491,327. **Tire Spreader.** R. A. Morse, Linden, Tex.

2,491,343. **Injection Molding Machine.** E. I. Valyi, assignor to A. R. D. Corp., both of New York, N. Y.

2,491,395. **Extruded Plastic Material Slicer.** G. H. Searle, Kew Gardens, and W. D. L. Webb, Richmond, assignors to T. Wall & Sons, Ltd., all in England.

2,491,424. **Packaging Apparatus.** J. F. Stalter, assignor to Wingfoot Corp., both of Akron, O.

2,491,507. **Apparatus for Making Flat Plastic Articles.** G. A. Lyon, Allenhurst, N. J.

2,491,588. **Extrusion Die.** J. F. Shively, Sr., Belvidere, assignor to Hercules Powder Co., Wilmington, both in Del.

2,491,589. **Apparatus for Making Thermoplastic Tubing.** C. E. Slaughter, New Canaan, assignor to Extruded Plastics, Inc., Norwalk, both in Conn.

UNCLASSIFIED

United States

2,488,136. **Sterilizing Cabinet with a Section for Dairy Utensils.** A. E. Larson and C. Cardoza, both of Gustine, Calif.

2,488,376. **Fluid-Pressure Operated Tire and Rim Assembling and Locking Ring Applying Machine.** N. R. Clauser, Fort Wayne, Ind.

2,488,387. **In an Enclosed Dynamoelectric Machine Having Electrical Windings Insulated with Polysiloxane, Absorbent Material and Circulating Means for Removing Deleterious Compounds Evolved from the Polysiloxane.** H. M. Elsey, Oakmont, assignor to Westinghouse Electric Corp., East Pittsburgh, both in Pa.

2,488,426-427. **Tire Antiskid Device.** J. A. Morrone, assignor to Morrone Mfg. Co., both of Westerly, R. I.

2,488,456. **Air Valve for an Inflatable Body.** A. D. Walker and J. E. Drew, both of North Bergen, N. J.

2,488,481. **Spare Tire Mounting.** T. W. Stephenson, Detroit, and C. W. Bugbee, Royal Oak, assignors to Ford Motor Co., Dearborn, all in Mich.

2,488,539. **Rim-Removing Tool for Pneumatic Tires.** R. O. Holbrook, United States Navy.

2,488,578. **Insulation Tester.** W. D. Boynton, C. E. Lewis, and G. R. Page, all of Baltimore, Md., assignors to Western Electric Co., Inc., New York, N. Y.

2,488,632. **Mechanical Inner Tube.** L. Lepage, Rimouski, and J. A. De Champlain, Quebec, both in P.Q., Canada.

2,488,864. **Wheel and Tire Assembly.** G. A. Handy, assignor to Wingfoot Corp., both of Akron, O.

2,488,946. **Device to Fill Tires with Air or Liquid and to Withdraw Air or Liquid therefrom.** E. B. Turpin, Battle Creek, Mich.

2,489,088. **Lever-Operated Tire Loosening Device.** I. N. Hewitt, Medicine Lodge, Kan.

2,489,110. **Antiskid Chain Device.** H. L. Small, Auburn, Me.

2,489,397. **Tire Valve Actuating Mechanism.** H. Brummer, Queens Village, N. Y.

2,489,561. **Tire Carrier.** K. C. Clark, Watsonville, Calif.

TRADE MARKS

United States

512,260. **Young Look by Femode.** Corsets, etc. Femode Foundations, Inc., New York, N. Y.

512,261. **Figure-Pride.** Corsets, girdles, etc. Beautis Foundations Mfg. Corp., New York, N. Y.

512,278. **De Tura.** Hose supporters. De Tura Designs, Inc., New York, N. Y.

512,308. **Taylor-ed.** Footwear. E. E. Taylor Corp., Boston, Mass.

512,332. **Lane Bryant.** Footwear, gloves, corsets, etc. Lane Bryant, Inc., New York, N. Y.

512,339. **Arrowhead.** Faucet cushions, spacers, washers, gaskets, grommets, etc. Arrowhead Rubber Co., Vernon, Calif.

512,399. **Brooks.** Trusses, abdominal supporters, and suspensories. Brooks Appliance Co., Inc., Marshall, Mich.

512,409. Fanciful representation of a plug to represent a human being. Cables, cord sets, wires, etc. Phalo Plastics Corp., Dover, Del.

512,434. **Coronet.** Hose and packing. Quaker Rubber Corp., Philadelphia, Pa.

512,435. **Redskin.** Belting and hose. Quaker Rubber Corp., Philadelphia, Pa.

512,484. **Dr Scholl's.** Arch supports, insoles, etc. Scholl Mfg. Co., Inc., Chicago, Ill.

512,499. **"Wonder."** Erasers. Joseph Dixon Crucible Co., Jersey City, N. J.

512,514. **Dr Scholl's.** Arch supports, insoles, etc. Scholl Mfg. Co., Inc., Chicago, Ill.

512,515. **Re-Form.** Arch supports, etc. Scholl Mfg. Co., Inc., Chicago, Ill.

512,516. **Tri-Spring.** Arch supports. Scholl Mfg. Co., Inc., Chicago, Ill.

512,542. **Richmond Premium.** Tires. Richmond Rubber Co., Richmond, Va.

512,553. **Bull Dog.** Belting, hose, and jar rings. Boston Woven Hose & Rubber Co., Cambridge, Mass.

512,560. **Stream-Flex.** Hose. Gates Rubber Co., Denver, Colo.

512,592. Representation of a winged foot and the word: **"Goodyear."** Auto top dressing, etc. Goodyear Tire & Rubber Co., Akron, O.

512,612. **Southern Fiber Block.** Brake lining. Southern Friction Materials Co., Charlotte, N. C.

512,628. **Vacu-Lug.** Tire lugs. American Tire Machinery, Inc., Muncie, Ind.

512,857. Representation of a hand holding a foot and an arch support. Arch supports. Scholl Mfg. Co., Inc., Chicago, Ill.

512,874. Representation of a valet holding a man's suit. Suspenders. George Frost Co., Boston, Mass.

512,890. **Mar-Gro.** Corsets, girdles, etc. Wear-Rite Brassiere Co., Inc., New York, N. Y.

512,902. Representation of a flower between the words: **"Beauty Crest."** Shower curtains. F. H. Jaffe Mfg. Co., Chicago, Ill.

512,908. **Viglas.** Vinyl resin impregnated and coated glass cloth. Acme Backing Corp., Brooklyn, N. Y.

512,976. **Grip-Safe All-Wear.** Brake lining. Atlas Supply Co., Newark, N. J.

513,002. **Marshall.** Brake lining. Bendix Aviation Corp., Green Island, N. Y.

513,054. **Shoor-Tred.** Footwear. A. H. Geuting Co., Philadelphia, Pa.

513,056. **Bull Dog.** Suspenders, garters, etc. Hewes & Potter, Inc., Boston, Mass.

513,116. **Sidley.** Foundation garments, garter belts, etc. Sidley Co., San Francisco, Calif.

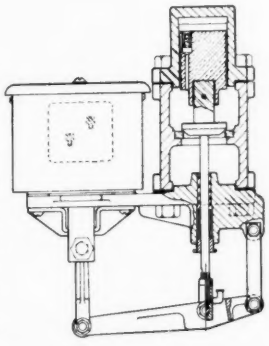
Compounding Ingredients — Price Changes and Additions

Antimony oxide, National Lead	lb.	$0.25	$0.26
Aquablaks	lb.	.0725	.17
Dichloro Pentanes	lb.	.04	.055
Emersol 110	lb.	.13	.14
120	lb.	.14	.15
130	lb.	.1625	.1725
210 Elaine	lb.	.1175	.14
Hi-Sil	lb.	.11	.12
Hyfac 430	lb.	.135	.145
431	lb.	.145	.155
Kosmobile 77/Dixiedensed 77	lb.	.069	.1125
Kosmobile S/Dixiedensed S	lb.	.069	.1125
Kosmobile S-77/Dixiedensed S-77	lb.	.069	.1125
Kosmos/Dixie BB	lb.	.18	.215
Monoplex DBS	lb.	.51	.52
DOS	lb.	.555	.565
Statex K	lb.	.07	.12
Voltex	lb.	.18	.215

New Machines and Appliances

New Solenoid Valve

TO ELIMINATE the water hammer that can result from the sudden closing of a valve in a high-velocity pipe line, the Johnson Corp., 869 Ward St., Three Rivers, Mich., has developed a special dash-pot design now available in its line of direct operated solenoid valves. Known as Series No. 4000, the new valve is designed for normally closed operation and slows down the closing action of the valve by 1½-2 seconds.



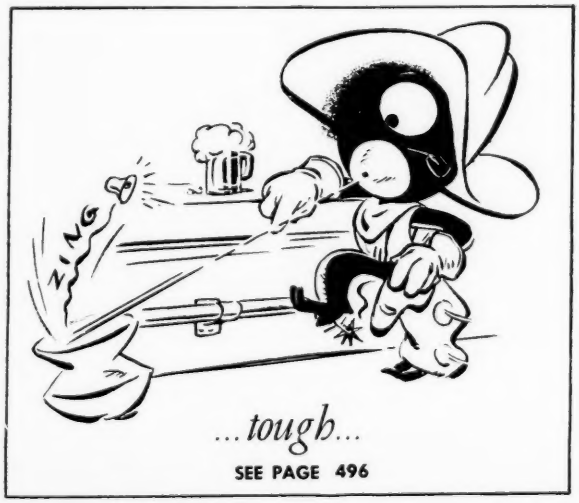
Cross-Sectional View of Johnson Series 4000 Solenoid Valve

Dash-pot construction consists of a bronze piston fitted within the top housing of the valve and pinned to the valve to follow its movement. An upward seating ball check controls the flow through a port in this piston. When the valve is opened and the piston moves up, liquid above the piston flows freely through the port so that there is no resistance to the instant opening of the valve orifice. When the valve closes, however, the ball check closes the port. Liquid must then flow between the piston and the housing, a restricted passage which slows the closing of the valve. Piston and valve are independent of the action of the valve-opening push rod.

The new Series 4000 valve, built for heavy-duty service, has no auxiliary pistons to expose close tolerances to silt laden liquids. The valve handles temperatures up to 400° F., and smaller sizes will operate under differential pressures up to 150 pounds. Solenoids are rated to provide unusual reserve factor. The body of the valve is bolted together for maximum strength and easy access to all operating parts. The standard construction consists of a cast-iron body with bronze piston, but all-bronze construction can be furnished. Both the valve and the seat are of stainless steel. The new valve is available in ¾-, 1,-1¼-, 1½-, and 2-inch sizes.

Plastics Hand Welder

THE new Hot Jet Heater, a portable hand-operated heater for use in the welding and sealing of plastics, has been developed by DeBell & Richardson, Inc., Hazardville, Conn. The new unit provides a flameless blast of hot air or gas by which plastics can be heated, melted, sealed, or welded, and is said to be ideally



SEE PAGE 496

AA-219

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Hot Jet Heater, Showing Heater Control Panel and Carrying Case

suited to the fabrication of plastics difficult to weld or join by other means. Designed for compactness, the unit has a completely sealed three-pass heat exchanger that gives efficient performance and allows the delivery of air or gas at any temperature up to 700° F. and at pressures from five to 40 p.s.i. Built for continuous operation, the heater can be fitted into machinery where sources of spot heat are needed and can also be used for many other purposes, including curing of adhesives, paint removal, heat cleaning, and general laboratory use. Welding rods, fluxes, adhesives, etc., are available for use with the heater.

The Hot Jet comes in a sturdy steel carrying case weighing a total of 30 pounds with heater and control panel. The control panel readily slips in and out of the carrying case. It mounts a voltage regulator for operation from 0-115 volts, and a reducing valve for adjusting air or gas pressures and operating from line pressures up to 300 p.s.i. Ten feet of heater cord and air hose lead from the panel to the heater which has a cartridge heating element and an insulated plastic handle. The heater body is of spun aluminum with air passages proportioned for turbulent flow. The stainless steel glass-lined nozzle is easily detached from the standard compression fitting and provide for the attachment of special nozzles.

Lake Erie 1,000-Ton Lead Extrusion Press with Automatic Billet Loader

Lead-Encasing Presses

A SERIES of lead extrusion presses for cable and hose encasing that incorporate many new design features and are said to be 30% faster than previously available presses has been developed by Lake Erie Engineering Corp., Buffalo 17, N. Y. The new presses are fully automatic and, in addition to their labor saving features and high extrusion rates, are designed to require a minimum of floor space and allow maximum accessibility to all working parts.

The largest model has a capacity of 2,500 tons and is fitted with an automatic lead billet loader. Two other models have capacities of 1,000 and 500 tons, respectively, and can be equipped with either automatic or manual billet loaders, as required. All models are self-contained, four-column, downstroke types. The columns are fitted with spacers which provide the rigidity of a housing-type press while maintaining the die accessibility of the open four-column type press. All piping is threaded, assembled, and welded to assure leak-proof operation.

New Goods and Specialties

Rubber Pail

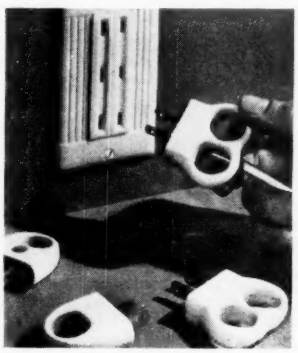
Stokes Molded Rubber Pail

A NEW molded pail, utilizing a virgin rubber base compound and other original features giving greater safety and serviceability in the handling of acid and alkaline chemicals, has been developed by Stokes Molded Products, Inc., Trenton 4, N. J. The pail will not crack or chip, and the rubber compound gives the pail greater resistance to corrosive chemicals, abrasion, and heat than conventional compounds, it is also claimed.

Said to be light in weight, shock resistant, rigid, and almost chemically inert, the new pail is equipped with a bail-type handle of lead plated stainless steel with a hard rubber grip. To assure smooth leverage, the bail is mounted in cast lead bearings molded into the bucket to prevent it from pulling out of place. Other safety features are a pouring lip which reduces drip, and a molded tipper on the bottom of the pail which provides a firm hold for accurate control of pouring. The new pail is supplied with graduated markings for measuring one quart to 12 quarts or one gallon to three gallons. Extensive data on the resistance of the pail to many types of corrosive chemicals are available from the manufacturer.

Electrical Plug

DIFFICULTY in removing electrical plugs from wall receptacles has been virtually eliminated by the Thyco plugs, made by Thyco Electrical Products, Inc., Los Angeles, Calif. These plugs are equipped with finger grips which solve the problem of plugs sticking or being hard to grasp. The plugs are molded with ivory colored Beetle plastic, made by American Cyanamid Co., a material which is attractive, durable, and an excellent electrical insulator. The new product minimizes wear and breakage of both plug and cord and greatly reduces the danger of electrical shock and fire hazards from bare wires.



New Thyco Electrical Plugs with Finger Grips

Plastic Quilting

SEALTUFT, a new stitchless, quilted plastic material that makes possible a wide variety of new decorative applications in the fields of upholstery and wall covering, has been developed by Jason Corp., Hoboken, N. J. The material is made by electronic heat sealing of a "sandwich" consisting of a front and backing of Vinylite plastic sheeting, made by Bakelite Corp., and an inner layer of fire-resistant filler material. The front Vinylite surface can be supplied either plain or embossed in patterns resembling leather, sharkskin, moire, or taffeta.

The finished quilting appears heavily padded and luxurious. The process gives a uniform pattern, unlike that attained by stitched quilting, and added strength to the finished product.

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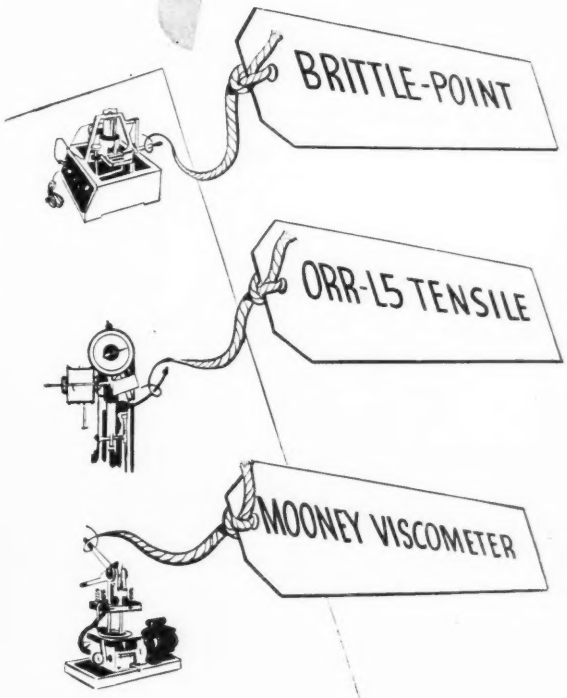

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SWING and BALL JOINTS...

—for use on rubber and plastic molding presses. Especially constructed to offset expansion and contraction caused by sudden change from high pressure steam to cold water. Permanently ends leaking nuisance. Ball joints recommended to correct misalignment in any hook-up.

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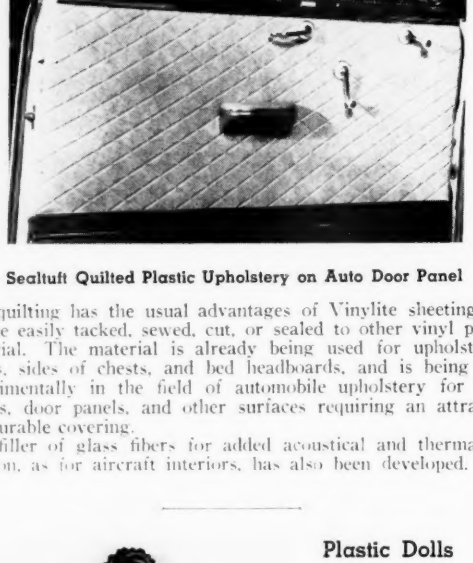


Sealtuft Quilted Plastic Upholstery on Auto Door Panel

The quilting has the usual advantages of Vinylite sheeting and can be easily tacked, sewed, cut, or sealed to other vinyl plastic material. The material is already being used for upholstering chairs, sides of chests, and bed headboards, and is being used experimentally in the field of automobile upholstery for scuff boards, door panels, and other surfaces requiring an attractive and durable covering.

A filler of glass fibers for added acoustical and thermal insulation, as for aircraft interiors, has also been developed.

Transplastic's Vinyl Toys: *(Top, L. to R.)* **Scotch, Tyrolean, and Clown Dolls, and** *(Bottom)* **Teddy Bear-Panda Combination**

Plastic Dolls

A NEW line of inflated vinyl plastic dolls is being manufactured by Transplastic Mfg. Co., Inc., New York 11, N. Y. The toys are made from sturdy 0.012-inch thick Vinylite plastic, made by Bakelite Corp., and gaily decorated with scuff-proof, non-toxic colors. The toys are therefore ideal for small children since they may be scrubbed thoroughly without damaging the colors, and the heavy gage plastic enables them to withstand rough treatment, it is further claimed. Arm and leg joints are constructed to permit flexing and allow the dolls to stand or sit. A flat tuck-in valve permits easy inflation.

There are three dolls in the series, each with a rigid plastic face which gives greater realism. The Tyrolean, Scotch, and Clown dolls are all dressed in authentic two-color costumes for added appeal. The fourth member of the series is a Teddy Bear and Panda combination; one side is a teddy bear, and the other a panda, and each is different in coloring. This toy also contains two jingle bells to amuse the youngster.

Combination Mat and Cutting Board

UTILITY and attractiveness are combined in a new product for housewives recently introduced by Wooster Rubber Co., Wooster, O. Called the Handimat-Cutting Board, it is a two-surface rubber mat and cutting board which may be used on one side as a protector for drain boards, stove tops, and utility tables, and on the other side as a cutting board. The board, 16 by 20 inches in size, is available in five marbleized colors. The protective mat is heavy, tough ribbed, heat resistant, and has a food measuring table stamped on one end. The cutting board, which is neutral in color and will not show knife blade marks, gets its hardness and toughness from reinforcement by Good-rite Resin 50, a product of B. F. Goodrich Chemical Co., Cleveland, O. According to Wooster, the satisfactory results obtained thus far with the reinforced surface indicate that it is superior to wood, the conventional cutting board material.

EUROPE

FRANCE

History of Vulcamel

The history of the development of the Buna S-type French synthetic rubber known as Vulcamel, has been briefly discussed by R. Buret.[1] The work was started in 1936 when the Usines de Melle, in France, undertook the synthesis of butadiene on an industrial scale at the suggestion of the Polish Government. The classic reaction series of ethanol, ethanal (acetaldehyde), aldol, butanediol 1-3, butadiene was employed. To overcome the difficulty encountered in the hydrogenation of aldol, the process was planned for the use of low pressures and highly active catalysts. A method was worked out in which after hydrogenation of the aldol in liquid phase under 20-kilogram pressure, in the presence of a Raney-type Nickel, the diol was rectified and then dehydrated to butadiene. The difficulty here was the possibility that incomplete dehydration would lead to the formation of three butenols; but this was solved in 1939 by the use, as catalyst, of monocalcium phosphate in presence of amine phosphates. In this way a yield of 87% of butadiene was obtained.

Research, interrupted by the war, was resumed in 1941, when an improved process was developed in which diacetoxybutane-1,3 was prepared from butanediol-1,3 and pyrolyzed to butadiene.

The next problem was to make a rubber with the aid of copolymers and catalysts not already patented by the I. G. Farben. In 1938, Melle had patented the use of peroxide of methyltetrahydrofurane, highly active catalysts; and in 1941 were patented copolymers resulting from the reaction of an aldehyde on a product with active methylene (ethyl cyanacetate). With these products the rubber Vulcamel was developed, which in 1943 was a material superior to Buna S; now, however, it is excelled by the new cold GR-S.

Vulcamel is further handicapped by the cost of ethyl cyanacetate.

At one time it seemed likely that a factory for French synthetic rubber would be built, having an annual productive capacity of 6,000 tons, but under present conditions with natural rubber freely available, it does not look as though much progress will be made in this direction in France, and for the present, at least, Vulcamel will probably find only limited use there for special purposes.

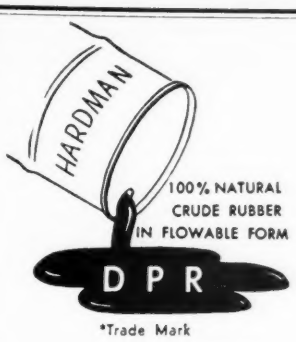
[1] *Rev. gén. caoutchouc*, 26, 11, 738 (1949).

"French Rubber in Danger"

A recent article, "French Rubber in Danger," sounds the alarm over the perilous position in which politics in France have placed the rubber planting industry of Indo-China. The occasion for the item is the report that a new and important section of the Indo-China rubber plantations is about to close down, and the responsibility is placed squarely on the government, which, it is stated, has decided, purely as a matter of politics, to maintain the piaster (currency of Indo-China) at the artificial rate of 17 francs, when its real value is below the prewar rate of 10 francs and certainly does not now exceed eight francs. This move, it is emphasized, renders futile any hope of successful competition with British or Dutch rubber on world or even on French markets.

The writer points up the abnormal situation in which guilders and florins are being freed on a large scale by the French Government, while unsold Indo-China rubber is piling up on the wharves at Saigon; in which France's source of supplies is deliberately to be permitted to dry up, and at the same time pave the way for a permanent and increasing drain on foreign currency, whereas the Union Française should easily be able to supply all its own needs and even have a surplus over for conversion into foreign currency; in which the government leaves French planters and rubber manufacturers in a position which threatens to split them—for the former, at the end of their rope, see no solution but an increase in price, while the latter are uneasy about the approaching severe competition expected now that sales restrictions on tires have been lifted, and naturally have no desire to increase their burdens.

[1] *Rev. gén. caoutchouc*, Nov., 1949, p. 709.



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French Rubber Trade Notes

A very simple portable screw-press type of vulcanizer for repairing inner tubes, air cushions, and air mattresses has been developed by Etablissements E.C.A., Paris. With the device are supplied ten pieces of hot-vulcanizing compound in different sizes. The procedure is first to scrape the area around the tear or hole and to place a piece of compound of the appropriate size over the damaged part before placing the whole between the jaws of the press and screwing down. Then heat is produced by applying a lighted match to a non-flaming product in a cup in the device, and in five minutes the repair has been made. The advantages of the apparatus are that it is small—the dimensions being 12 x 12 x 8 cm.—weighs only one pound, and requires no electricity, so that it can be carried about easily and used anywhere.

In the first half of 1949, France imported 43,701 metric tons of rubber, as compared with 39,123 metric tons in the 1948 half. France has been getting more rubber from Malaya and Indo-China, but considerably less from Indonesia, detailed statistics show. In the 1949 period shipments from Malaya totaled 22,161 tons, against 19,046 tons in the 1948 period; totals from Indo-China were 15,325, against 14,159 tons; but from Indonesia, 975 against 2,982 tons. Arrivals of synthetic rubber from America rose to 4,532 tons in the first half of 1949 from 1,819 tons in the corresponding period of 1948.

The effect of copper and copper derivatives on the aging of rubber has been studied by H. Villain,[1] who found that most of the derivatives of copper are prooxygen and dangerously accelerate aging. Copper present in a complex, as in cuprous phthalocyanine, however, has no deleterious effect on rubber at all. But it is noted that the effect of a given derivative may vary considerably, depending on the composition of the mix. Certain ingredients, especially disulfide of T.M.T., neutralize the harmful action of copper, while the fatty acids increase it. Still, the presence of fatty acid is not indispensible for the development of the degradation process caused by copper, as was found in tests in which rubber had been deprived of its natural fatty acids.

[1] *Rev. gén. caoutchouc*, 26, 11, 740 (1949).

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ITALY

According to the Association of Rubber Industries, Italy produced 55,781 tons of rubber goods during 1948, including 27,416 tons of automobile tires, and 2,167 tons of tubes; 6,365 tons of cycle tires and 1,287 tons tubes; 4,574 tons footwear; 11,579 tons mechanical goods; 757 tons sanitary goods, and 1,636 tons soles, heels, and the like. The total tire output of 37,235 tons represents an increase of 12% over that of 1947 and 10% over 1938. The industry used about 30,000 tons of natural rubber; 1,500 tons latex; 2,250 tons synthetic rubber; 6,700 tons carbon black; 5,000 tons cotton, and 4,700 tons artificial fibers; it employed some 46,000 persons.

Production in the first four months of 1949 showed an increase for automobile tires to 9,767 tons, as compared with 8,454 tons in the corresponding period of 1948. Output of rubber heels and soles and mechanical goods increased, but footwear and inner tube production declined somewhat.

Production figures for May and June, 1949, have not yet been made available, but it is indicated that they were substantially above those for March and April.

Exports for 1948 were estimated at 9,000 metric tons, approximately the 1938 level. It is to be noted that while automobile tires and footwear exports were above those of 1947, exports of cycle tires and mechanical goods dropped. Italy's best customers were the North European countries, Africa and the Middle East; some shipments were also made to Australia.

Of the important rubber manufacturing countries of Continental Europe (excluding Russia) Italy seems to have been in the fortunate position of being able to make the readjustment to peacetime conditions most rapidly, which gave her a head start in the production of rubber goods. However, although the output of rubber manufactures, especially of tires and tubes, which is now above prewar level, continues on the whole to increase, observers see signs indicating that the Italian rubber industry is beginning to feel the effects of keener competition from other European countries which have meantime substantially rehabilitated their own works. In this connection one foreign writer points to the fact that at least 30 small and medium-sized Italian factories have had to close down, as proof that this competition is forcing a shake-out of the weaker and less efficient firms.

GERMANY

The Economic Administration of the Combined Zones reports an upward tendency in the production of all pneumatic tires, except for trucks, during the second quarter of 1949. Output of rubber soling material was stimulated by lessened competition from the leather article as a result of the high prices for leather; but there was a drop in conveyer belting output in June.

Sales of cycle, motorcycle, and passenger-car tires continued favorable, but those of truck tires declined, as did those of several other types of rubber goods, supply of which is apparently outstripping demand. On the other hand the market for articles like sporting goods and toys of rubber, manufacture of which is now again permitted, has reportedly been very active.

The trend of production of some of the most important rubber goods during April, May, and June, 1949, as compared with an average month for the second half of 1948, are shown in the table below:

		Second Half, 1948	April, 1949	May, 1949	June, 1949
Cycle tires	units	962,000	1,370,000	1,450,000	1,653,000
Motorcycle tires	units	19,091	37,780	43,049	58,600
Passenger-car tires	units	116,913	170,050	200,752	207,535
Truck tires	units	81,214	78,876	69,199	49,326
Conveyer belts	tons	756	369	410	388
Soling material	tons	2,350	1,249	1,360	1,422

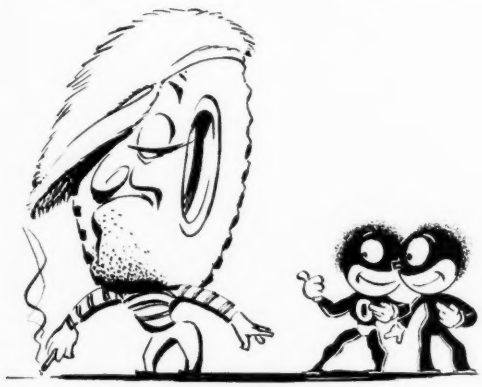
The Joint Export-Import Agency reports imports into the Bizonal Area of Germany in the first half of 1949 included tires and tubes and repair materials to a value of $2,950,705 (U. S. currency); crude rubber and allied gums, $8,531,136; synthetic and reclaimed rubber, $131,771; and miscellaneous rubber products and rubber scrap, $867,479.

During the same period exports from the Bizonal Area included tires and tubes and repair materials valued at $222,121; crude rubber and allied gums, $1,746; and miscellaneous rubber products and rubber scrap, $89[illegible]202.

C. Muller Gummiwarenfabrik, Weissensee, Berlin, which had hitherto restricted its activities to the repair of surgical and sanitary goods of rubber, is now preparing to resume manufacture of its former specialties which included hard and soft rubber surgical articles and certain kinds of mechanical goods.

SPAIN

Shortage of crude rubber in the first half of 1949 forced tire manufacturers in Spain to reduce production considerably below capacity. About 1,000 tons of crude rubber sent by Singapore seems to have been practically all the rubber entering Spain during the first half of the year, and only two thirds of this was allocated to tire manufacturers. In the beginning of 1949, it had been arranged to import 2,000 tons from Indonesia, but Spain is said to have failed to supply quantities of goods stipulated in a trade agreement with the Netherlands, and that country refused to give Spain the necessary export licenses.



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Experiments started a few years ago in growing guayule in Spain have proved successful, the local press reports. As a result of work in the Huelva territory, a stock of seed could be accumulated, and the first pilot plantation is being started here. It is understood that 1,000,000 young plants have been set out, from which it is expected to be able to get 25 tons of good-quality latex.

BELGIUM

The rubber industry in Belgium worked at less than 50% of capacity during at least part of 1949. Output in the first half of 1949 included about 396,000 tires, 292,000 tubes, and some 11,000 metric tons of all other rubber goods.

Imports of all kinds of rubber goods in the first half of 1949 declined to 2,728 tons, as compared with 3,113 tons in the first half of 1948.

Solvay & Co., Brussels, has made an agreement with Imperial Chemical Industries, Ltd., London, England, whereby polyvinyl chloride and derivatives will be manufactured in Belgium and certain other European countries according to I.C.I. processes. In association with the English firm Solvay & Co. has formed Solvic S.A., and plants for producing vinyl chloride monomer and polymer have been built at Jemeppe-sur-Sambre on part of the property of the Solvay company. Products made here were expected to be on sale by the end of 1949, going under the trade name of "Solvic."

Heading Solvic S.A. is Leon Flamache, for many years manager of general research in Solvay & Co.

It is understood that I.C.I. will not only give fullest support to the new companies undertaking the production of polyvinyl chloride and the various derivatives, but will also provide technical service to customers and advise on the development of new uses.

NETHERLANDS

A new type of rubber spring,[1] designed for use in upholstering and also for cycle and motorcycle saddles, consists of a hollow rubber cylinder divided into sections by circumferential grooves and provided with a kind of flange at top and bottom. Metal rings fit into the grooves, and lateral perforations appear in the cylinders so that when pressure is applied, a bellows action is produced, and air is expelled laterally. The cylinders are available in rubber of various degrees of flexibility and in different sizes including from two to four sections so that a variety of purposes can be met.

To construct a seat with these springs, the cylinders of the desired size and flexibility are mounted on a hard support having holes in which the bottom flanges fit. This support may be of wood, metal, or hard rubber. A sheet of not too yielding rubber, having holes for the top flanges, is fitted over the upper surfaces of the cylinders, and over this a layer of kapok, hair, felt, etc., and finally the cover. The seat thus produced is said to be firm, yet sufficiently yielding to be comfortable; it is very durable and, since it is self-ventilating, remains cool.

[1] *Rubber*, Oct., 1949, p. 12.

AUSTRIA

Thanks to increased supplies of raw materials, as rayon cord, carbon black, and synthetic rubber, obtained through E.C.A. and Austrian-financed imports, at a time when reconditioned machinery was ready to resume operations, production of rubber goods in the first half of 1949 more than doubled, as compared with the same period of 1948. Output of all types of rubber goods amounted to 5,569 metric tons in the 1949 period, against 2,819 metric tons the year before.

Figures for tires and tubes are incomplete, but details regarding footwear manufacture reveal that production has gone forward by leaps and by bounds. In the first half of 1948 the total for rubber and rubber-soled footwear was 363,336 pairs; in the second half, the figure rose to 611,537 pairs, and in the first half of 1949, to 886,336 pairs. Production in the 1949 half year was not much below the total (974,873 pairs) for all of 1948. Indeed

a breakdown by classes of footwear shows that in the first half of 1949 the output of rubber boots and of shoes with rubber soles exceeded that for the entire year 1948.

A progressive increase has been made in tire output in Austria in the period January 1, 1948, to June 30, 1949, recent statistics reveal, as follows:

Tire	First Half, 1948	Second Half, 1948	First Half, 1949
Heavy-duty	11,989	22,484	39,177
Motorcycles	2,907	6,549	15,777
Bicycle	301,430	442,227	659,163
Passenger-car	21,876	37,419	34,143

GREAT BRITAIN

To meet the special needs of a Liverpool firm of haulage contractors transporting unusual loads, the Leyland & Birmingham company has been conducting experiments with tires filled with water instead of air. The inner tubes are completely filled with water at a pressure of 55 pounds, which is automatically lowered to 50 pounds after an hour's running. To preserve the rubber and prevent freezing, a certain amount of calcium chloride is added to the water. Reports on results obtained so far, indicate that the water-filled tires, mounted on the rear wheels of tractors, give better adhesion than air-filled tires, and that the tendency to skid is reduced; it is also considered likely that they will last longer since there is less heat build-up than in the usual air-filled tires.

P. Dunsheath, director and consulting engineer of W. T. Henley's Telegraph Works Co., Ltd., has been appointed Chairman of Convocation of the University of London.

The Plastics and Polymer Group of the Society of Chemical Industry will hold a three-day symposium in London in September, 1950, under the title, "Polymer Chemistry as Applied to Plastics." It is intended in this way to offer chemists working on plastics and polymer chemistry an opportunity of once again meeting after an interval of many years, to discuss recent advances of polymer science and their practical effects.

YUGOSLAVIA

The Yugovinil plastics factory recently opened at Kastel Sucurac, Yugoslavia. Details are not available, but judging by the name of the factory, the chief products will be vinyl plastics, and it seems that output will be high enough to make the country a relatively important producer of plastics.

UNION OF SOUTH AFRICA

The import restrictions in South Africa hastened the decision of the Kelly Springfield Tire Co. to begin the manufacture of passenger-car and truck tires, tubes and accessories here. According to a report from Capetown, the plans of the company have progressed to the stage where it can expect to begin producing within two or three months.

Railway experts in South Africa are understood to be considering a suggestion made by G. J. J. Wedderburn, secretary of the Transport Owners' Association, Johannesburg, to connect that city with Durban by a system of conveyer belts. The distance from Johannesburg, which is inland in the South of Transvaal, to Durban, on the coast of Natal, is more than 400 miles by train.

Mr. Wedderburn reportedly has in mind a series of huge belts feeding one another and driven by a series of engines, the whole to be protected from rain by a corrugated iron structure built over it. He foresees a main belt-line fed by subsidiary lines radiating throughout South Africa and believes local rubber companies could design and produce the right kind of belts. The system would be used for carrying materials as maize, manganese, chrome ore, coal, and would not be designed to supplant railways, but to speed up transportation of goods by eliminating loading, unloading, and marshalling of trucks.

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Editor's Book Table

"The Petroleum Chemicals Industry." Richard Frank Goldstein. Published by E. & F. N. Spon, Ltd., 57 Haymarket, London S.W.1, England. Cloth, 6 by 9¾ inches, 462 pages. Price, £3,3s.

Although much of the petrochemical industry originated and was developed in the United States, the author, a research chemist with Imperial Chemical Industries, Ltd., has presented the first authoritative and comprehensive review of the field since the publication in 1937 of Carleton Ellis's "Chemistry of Petroleum Derivatives." Both principles and practices are covered, and the subject matter is well selected and presented in readable style. The only drawbacks to facile use in this country are the many references to British patents and omission of corresponding U. S. patent numbers, and the references to BIOS reports on German industrial practices which also suffer from insufficient description.

The book comprises 20 chapters dealing with sources of petroleum hydrocarbons; synthesis and reactions of carbon monoxide-hydrogen mixtures; oxidation of paraffins; chlorination of paraffins; paraffin nitration; manufacture, hydration, and oxidation of olefins; reactions of olefins; diolefins; naphthenes; aromatics; acetylene; aldehydes; ketones; acids, anhydrides, and esters; olefin oxides; nitriles and amines; and chemical by-products of petroleum refining. Appendices on petroleum chemical manufacture and statistics are included, and there are patent numbers and German intelligence reports as well as author and subject indices.

"Physics and Chemistry of Cellulose Fibres with Particular Reference to Rayon." P. H. Hermans, Elsevier Publishing Co., Inc., 215 Fourth Ave., New York 3, N. Y. Cloth, 6¼ by 9½ inches, 556 pages. Price, $7.50.

This book is an attempt to explain the empirical knowledge of rayon technicians in terms of polymer chemistry and, as such, is eminently successful. Instead of a literature review, the book includes hitherto unpublished material and the author's interpretations of laboratory work made possible by his long industrial experience. This volume, therefore, is an important contribution to cellulose polymer technology and will fill an important place in the libraries of all cellulose chemists and research men.

The book is divided into three main sections. Part I, consisting of five chapters, covers the constitution, crystallinity, micellar structure, molecular weight, chemical behavior, and dispersion of cellulose. The eight chapters, comprising Part II, describe the general properties, morphology, micro structure, and physical and chemical behavior of cellulose fibers. The concluding section, comprising 18 chapters, is devoted to artificial cellulose fibers, including viscose, the spinning process, cellulose gels, and other topics. An appendix on the crystalline-amorphous ratio in cellulose fibers is included, and subject and author indices are appended, all adding to the convenience of this book.

"Industrial Rheology and Rheological Structures." Henry Green. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. Cloth, 5½ by 8½ inches, 320 pages. Price, $5.50.

Rheology is the study of relations between stress, strain, and time in materials which do not obey Hooke's law of elasticity. It deals with the analysis of deformation phenomena, experimental techniques for studying these phenomena, and with their interpretation in terms of molecular structure. Different types of materials show differences in rheological behavior and require individual consideration and study. Although intended "to give the laboratory man a workable rheological system," according to the author's preface, the book meets this purpose in only a limited sense. The subject matter is restricted to materials which exhibit Bingham body behavior and thixotropy and which can be tested in the rotating cylinder viscometer of the author's design. Discussions of other types of behavior and experimental methods are quite meager.

Written in a readable style, the book comprises 18 chapters divided into four sections: a rheological system; the system applied to laboratory measurements; the particle—the basis of rheological structure; and particle groups rheological structures. Summaries and lists of questions and problems are included in the chapters, and appendices include answers to problems, literature references, glossary of terms, and author and subject indices.

NEW PUBLICATIONS

"Picco Solvents and Solvent Oils." Pennsylvania Industrial Chemical Corp., Clairton, Pa. 6 pages. This brochure offers tabular data on the properties of the company's solvents and solvent oils, including aromatics and naphthas, and gives brief descriptions of their applications. Related information on testing methods, significance of data, solvent handling, and other topics, is also included.

"Vinylite Resins and Plastics." Bakelite Corp., 30 E. 42nd St., New York 17, N. Y. 40 pages. This revised edition contains data on the company's vinyl resins and their properties and gives information and illustrations on their use in various types of products, including film, monofilaments, molding and extrusion, plastisols, coatings, adhesives, and wire insulation. A brief section on the properties and uses of Bakelite polyethylene is also included.

"Vinylite—Vinyl Butyral Resins." This bulletin presents information on the general properties of Bakelite's two grades of vinyl butyral resins, their compatabilities with other resins and gums, their solubilities in various solvents, and their applications, with special reference to their use in "wash primer" types of metal conditioning coatings.

Publications of the British Rubber Producers' Research Association, 48 Tewin Rd., Welwyn Garden City, Herts., England. **"Kinetics of Olefin Oxidation."** J. L. Bolland. Publication No. 113. 22 pages. A general review is given of the problem of olefin oxidation with emphasis on kinetics. Evidence leading to the formulation of oxidation processes as radical chain reactions is outlined. **"Kinetic Studies in the Chemistry of Rubber and Related Materials. VII.** The Mechanism of Chain Propagation in the Oxidation of Polyisoprenes." J. L. Bolland and P. Ten Have. Publication No. 114. 8 pages. The oxidation of natural rubber and other polyisoprene differs from that of monoolefins in that the main primary oxidation product contains half its oxygen combined in six-membered rings. Kinetic evidence for this statement is given in this paper; while the chemical evidence was included in Publication No. 110. **"Cylindrical Shear Mountings."** R. S. Rivlin and D. W. Saunders. Publication No. 115. 12 pages. The effects of bending and shearing are investigated experimentally for cylindrical shear mountings of various length to radius ratios. Results are compared with good agreement to the classical formula for deformation of a beam under terminal load. The linear relation between torsional couple and amount of torsion of a rubber cylinder is verified, and the elastic modulus relating these two quantities is identified with the rigidity modulus. **"The Reaction of Sulfur and Sulfur Compounds with Olefinic Substances. Part VI.** Factors Influencing Cyclic Sulfide Formation in the Reaction of Sulfur with Polyisoprenes." George F. Bloomfield. Publication No. 116. 4 pages. Evidence is presented to suggest that cyclic sulfides are mainly secondary decomposition products of the vulcanization reaction. It is argued that the superior properties of accelerated vulcanization reflect a lower content of cyclic sulfide. **"Dielectric Loss in Swollen Rubber."** A. Schallamach and P. Thirion. Publication No. 117. 8 pages. A mixture of two non-associated polar liquids behaves dielectrically like one liquid with one relaxation time, but rubber swollen with polar solvents always exhibits two maxima of the loss-tangent curve, indicating two relaxation times. It is concluded that the chain structure of the rubber necessitates a type of activation different from that of polar liquids.

"Reclaim in a First-Quality 'Cold Rubber' Tread—A Road Test." Report No. 13. Midwest Rubber Reclaiming Co., East St. Louis, Ill. 4 pages. Data show that M-461, a peel reclaim, and Midco, a whole tire reclaim, can be recommended for use with "cold rubber" in a first-quality passenger-tire tread compound. Results are based on extensive road tests made with St. Louis taxicabs, and a description of the test is given together with data obtained.

"Annual Report on the Progress of Rubber Technology." Vol. XII, 1948. Published by W. Heffer & Sons, Ltd., Cambridge, England, for the Institution of the Rubber Industry, 12 Whitehall St., London S.W.1, England. Paper, 7¼ by 9⅝ inches, 114 pages. Price: members 4/6; non-members 12/6. Following the style of previous issues, this report contains contributions by 21 authors covering developments during 1948 in 22 branches of the rubber industry. Bibliographies are included in each article, and name and subject indices are appended to the volume.

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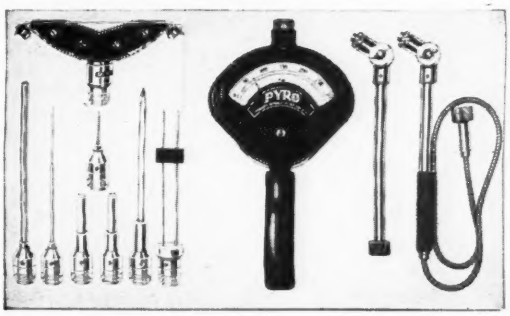

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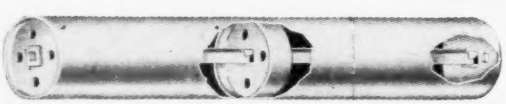
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"Products and Services of American Cyanamid Co. for Industry and Agriculture." Second Edition. American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y. 64 pages. This illustrated catalog briefly describes and lists the products made by the company for industry, agriculture, and mining and outlines the divisional structure through which these products are sold.

"Directory of British Rubber Manufacturers and Products." 1949 Edition. Federation of British Rubber Manufacturers' Association, 43 Bedford Square, London W.C.1, England. 288 pages. This comprehensive, illustrated directory of the British rubber industry consists of five sections. The first section lists manufacturers and their addresses and the names, addresses, and products of their overseas distributers. The second section consists of a classified list of rubber products and their suppliers; while the third section contains advertisements and catalogs of the various companies. The British tire industry and its members are covered in the fourth section, and the concluding section gives a list of trade names and trade marks. Descriptive material and lists appear in English, French, and Spanish. Copies of this directory are available for consultation by interested firms at the principal British consulates in the United States.

"Flame Sprayed Polyethylene." Technical Data Sheet No. 103D. Schori Process Division, Ferro-Co Corp., Long Island City 1, N. Y. 6 pages. This bulletin offers detailed data on the flame spraying of polyethylene with the Schori pistol. Topics discussed include preparation of the surface; adhesion of the coating; shape and thermal properties of the object being sprayed; smoothness of coating; coating procedure; coating thickness, properties, testing, and repair; and the Schori flame pistols. Tables showing resistance of the coating to different chemicals are also included.

"Perkin-Elmer Instrument News for Science and Industry." Vol. 1, No. 1. Autumn, 1949. Perkin-Elmer Corp., Glenbrook, Conn. 8 pages. This is the first issue of the company's new quarterly publication devoted to the use of modern electro-optical instruments in industry. Of special interest in this issue is a story on the role played by the infra-red spectrometer in United States Rubber Co.'s work on "cold rubber," where the instrument was used to determine molecular uniformity and analyze the constituents of "cold rubber."

"Tenite Injection Molding." Tennessee Eastman Corp., Kingsport, Tenn. Third Edition, 1949. 56 pages. This revised edition offers detailed data, including diagrams, on the injection molding of Tenite, including choice of material, product design, injection machines, mold design and construction, and product finishing. A listing of molding difficulties, including possible causes and suggested solutions, also appears as well as a section showing typical injection molds for different types of products.

"How to Handle Adhesives for Transparent Films." National Starch Products, Inc., New York, N. Y. 18 pages. In addition to information on the types of adhesives available for bonding transparent films and their use, this bulletin includes a handy chart on commonly used transparent films. This chart shows type of film, method of identification, manufacturer and trade name, available gages, grades, and characteristics.

"Rubber Developments." British Rubber Development Board, Market Bldgs., Mark Lane, London E.C.3, England. Vol. 2, No. 4, December, 1949. 36 pages. This issue contains the following articles: "Natural Rubber Powder in Roads," Harry K. Fisher; "Rubber and Modern Adhesives," L. C. Bateman; "The British Rubber Producers' Research Association. 3. The Technological Division," C. M. Blow; and "Tensile Properties of Rubbers at Elevated and Abnormal Temperatures," B. Boonstra. Other stories include natural rubber in the U.S.A., rubber coatings for deadening noise, Kuala Lumpur rubber road trials, and Positex developments.

Bulletins of Baldwin Locomotive Works, Philadelphia 42, Pa. **"Baldwin SR-4 Fluid Pressure Cell."** Bulletin 306. 2 pages. **"Baldwin Type 'C' SR-4 Load Cell."** Bulletin 307. 2 pages. These bulletins give general descriptive information on the use of their respective cells, together with diagrams showing constructional details, and complete specifications.

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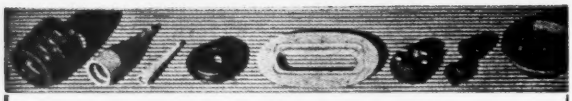

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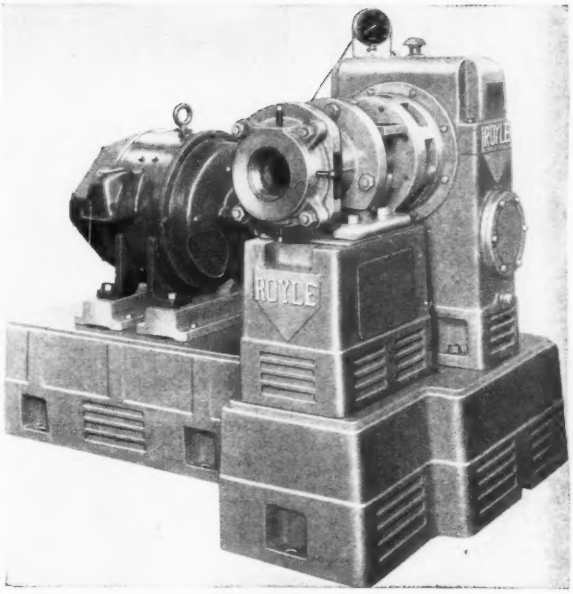

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Market Reviews

CRUDE RUBBER

Commodity Exchange

WEEK-END CLOSING PRICES

	Nov. 26	Dec. 31	Jan. 7	Jan. 14	Jan. 21	Jan. 28
Mar.	16.85	18.05	18.36	18.09	17.95	18.45
May	16.75	17.80	18.05	17.80	17.65	18.07
July	16.62	17.30	17.60	17.30	17.35	17.65
Sept.	16.52	17.20	17.50	17.20	17.20	17.50
Nov.	16.42	17.10	17.40	17.10	17.10	17.40
Jan.	16.32	17.00	17.30	17.00	17.00	17.30
Total weekly sales, tons	2,600	2,100	4,690	5,280	4,040	2,370

RUBBER futures prices on the Commodity Exchange during January reflected the movement of physical rubber prices. Trading volume was relatively light, with most activity consisting of liquidation of nearby positions and some speculative buying in the distant months.

Prices moved through relatively narrow ranges during the month. March futures started at 18.27¢ on January 3, rose to 18.50¢ on January 5, fell off and dropped irregularly to a low of 17.92¢ on January 19, then recovered to end the month at a high of 18.95¢. Other futures prices showed similar movement; July futures started the month at 17.55¢, reached a high of 18.00¢ on January 30, a low of 17.20¢ on January 19, and closed the month at 17.95¢. Total sales volume for January was 20,060 tons, as compared with December's total of 21,300 tons.

New York Outside Market

WEEK-END CLOSING PRICES

	Nov. 26	Dec. 1	Jan. 7	Jan. 14	Jan. 21	Jan. 28
No. 1 R.S.S.:						
Jan.	16.88	18.13	18.50	18.13	18.13	18.50
Feb.-Mar.	16.88	18.00	18.38	18.00	18.00	18.38
Apr.-June		17.88	18.25	18.00	18.00	18.25
No. 3 R.S.S.	15.88	17.63	18.00	17.75	17.63	18.13
No. 2 Brown	14.75	17.00	17.75	17.75	17.38	18.00
Flat Bark	13.75	15.13	16.50	16.50	16.25	16.75

DESPITE a firm undertone, prices and trading were irregular on the New York Outside Market during January. Much resistance to the high price level was shown by factory purchasing agents, but in the face of reportedly small inventories and expanding spring production schedules, buyers were forced into the market for purchases in moderate volume.

Several factors were held responsible for the strong position of natural rubber: (1) active European buying in London and Singapore; (2) restricted production in the Far East; (3) tight supplies of nearby physical rubber in the local market; (4) the absence of Dutch offerings; and (5) reported transportation delays of December shipment rubber.

In view of these factors most dealers look forward to firm natural rubber prices during the first quarter of the year, at least. Prices however, could be turned downward by either a resumption in large quantity offerings of cheap Dutch rubber, or a return to utilization of synthetic rubber by domestic manufacturers.

There are rumors that Dutch rubber may soon be offered to the domestic market in large volumes. Whereas until now the government has appropriated all dollars which Indonesian exporters received for their commodities, it is now said that exporters will be allowed to keep about 70% of the dollars entering the country through sales of rubber. This policy would have a decided downward effect on the domestic market, but many trade observers have expressed skepticism over the rumor and pointed out that 25% would be a more likely figure.

The spot price for No. 1 R.S.S. started the month at 18.38¢ and rose to 18.50¢ on January 5. The price remained at 18.50¢ until January 12, when the resistance of buyers forced a decline to a low of 18.00¢ on January 16 and again on January 18 and 19. As buyers were forced into the market to meet production schedules, prices recovered, and No. 1 sheets ended the month at the high of 18.75¢. Corresponding irregular motion was shown by other physical prices. No. 3 sheets started at 17.88¢, reached a low of 17.50¢, and closed the month at the high of 18.38¢. No. 2 Brown moved between 17.25¢ and 18.00¢; while Flat Bark fluctuated in the 15.75-16.88¢ range. As would be expected, the scarcity of No. 1 sheets resulted in a narrowing of the differentials for the off grades, which showed increased demand.

Latices

CONSUMPTION of *Hevea* latex declined from the October peak of 3,959 long tons, dry weight, to 3,662 long tons in November, a figure more in accordance with previous levels and the short stock position, according to Arthur Nolan, Latex Distributors, Inc. December receipts are expected to be heavy, possibly permitting increased consumption of January. November receipts of 3,511 long tons show the results of increased efforts in supply; while stocks of 4,793 long tons were an improvement over October stocks. Prices of standard 60-63% concentrates continued during January at the 25.5-27.5¢ a pound level.

Foam sponge continues as the largest single use for *Hevea* latex, with most present plants expanding their facilities and many new companies preparing to enter the field. Other primary uses are dipped toys, the production of which reached high levels during the past holiday season, and adhesives. It is estimated that the United States consumed 30,000 long tons, dry weight, of *Hevea* latex during 1949, out of a total world consumption of about 64,400 long tons. Consumption of latex throughout the world continues to increase, but the United States has outstripped the world by a large margin in use of synthetic rubber and plastic latices, of which some 25,000-30,000 tons are consumed annually in this country.

Production of GR-S latex in November totaled 1,879 long tons, dry weight; consumption, 1,429 long tons; and stocks, 1,588 long tons. According to Mr. Nolan, synthetic rubber and plastic latices are now making very substantial progress in the paper field, as additives to the pulp in the beater, for the manufacture of artificial leather and other products.

SCRAP RUBBER

MODERATE activity was reported in the scrap rubber market last month. Despite this activity it was said that in general no volume demand for either tires or tubes was noted from consumers and that actual shipments were limited. Most of the demand was reported to be in mixed tires, peelings, and red passenger tubes, but the price picture was unchanged. The export market was relatively quiet, although some inquiries from France were received.

In his statement on the outlook for 1950, Henry M. Rose, of H. Muehlstein & Co., Inc., and president of the Scrap Rubber Institute, said that increased freight rates on scrap rubber during the past few years have gradually narrowed the available territory for supplying scrap rubber. Any increased demand for raw material must of necessity broaden the available supply so that pricewise the position of the scrap rubber market is optimistic for the first half of 1950. Present market prices do not allow for any source of scrap rubber more than about 200 miles from the consuming area. For the mills to be assured of a continued flow of scrap, either prices must be increased, or freight rates reduced substantially.

Following are dealers' selling prices for scrap rubber, in carload lots, delivered to mills at points indicated:

	Eastern Points	Akron, O.
	(Per Net Ton)	
Mixed auto tires	$13.50	$13.50
Peelings, No. 1	52.25	52.25
3	30.25	30.25
	(¢ per Lb.)	
Black inner tubes	4.00	4.00
Red passenger tubes	7.50	7.50

RECLAIMED RUBBER

SALES of reclaimed rubber during January are estimated to be about 5% greater than the December level. One of the primary reasons for increased consumption of reclaim during the past two months is the relatively high price of natural rubber, which results in greater use of reclaim to offset higher product costs. Prospects for reclaim continue optimistic for the near future, at least, and production remains at a high level.

Final October and preliminary November statistics on the domestic reclaimed rubber industry are now available. October production totaled 20,683 long tons; consumption, 19,638 long tons; exports, 1,107 long tons; and month-end stocks, 26,619 long tons. Preliminary figures for November give a production of 19,363 long tons; consumption, 18,426 long tons; export, 800 long tons; and month-end stocks, 27,885 long tons.

No changes in reclaimed rubber prices occurred during January, and current prices follow:

Reclaimed Rubber Prices

	Sp. Gr.	¢ per Lb.
Whole tire	1.18-1.20	8.25/ 8.75
Peel	1.18-1.20	8.25/ 9.25
Inner tube		
Black	1.20-1.22	11.50/12.50
Red	1.20-1.22	14 /14.5
GR-S	1.18-1.20	9.5 /10
Butyl	1.16-1.18	8.5 / 9
Shoe	1.50-1.52	8.25/ 8.75

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LARGE FIRM HAS EXCELLENT OPPORTUNITY FOR EXPERIenced man to set up and manage plant in New York area, for manufacture of foam rubber and foam rubber products. State age, experience, background, etc. All replies held in strict confidence. Address Box No. 509, care of INDIA RUBBER WORLD.

WANTED: YOUNG MAN WITH TECHNICAL EDUCATION WITH some experience in latex, to work in a laboratory with ultimate view of possibly becoming a salesman of rubber chemical compounding materials. Address Box No. 510, care of INDIA RUBBER WORLD.

WE'RE AN OLD, WELL-ESTABLISHED, MIDWESTERN FIRM looking for an experienced rubber compounder between the ages of 35 and 40 to act as a practical trouble shooter. The right man must have a background in both natural and synthetic rubber, in factory processes involving mechanical molded goods and pharmaceutical sundries. He must have a knowledge of milling, extruding, molding, mold design, and new processing and mixing techniques. Immediate opening. Write full information concerning personal history, industrial experience, and references. Address Box No. 518, care of INDIA RUBBER WORLD.

RUBBER CHEMIST: MECHANICALLY MINDED DEVELOPment and quality control man to take charge of the technical portion of our rubber materials manufacturing. Send complete resume and recent full-length photograph, together with salary desired. Address KEASBEY & MATTISON Co., Ambler, Pa.

SITUATIONS WANTED

WESTERN REPRESENTATIVE: MANY YEARS' EXPERIENCE in mechanical rubber goods manufacturing and national sales, wishes to represent mechanical rubber factory on Pacific Coast or 11 western states. Can furnish excellent references as to character and ability. Address Box No. 498, care of INDIA RUBBER WORLD.

Top-Quality that never varies!

THE GENERAL TIRE & RUBBER COMPANY
AKRON, OHIO

WABASH, IND. • HUNTINGTON, W. VA. • WACO, TEXAS
BAYTOWN, TEXAS • BARNESVILLE, GA. • PASADENA, CAL.
JEANNETTE, PA.

Associated Factories:

CANADA • MEXICO • VENEZUELA • CHILE • PORTUGAL
UNION OF SOUTH AFRICA

(Classified Advertisements Continued on Page 615)

The above list includes those items or classes only that determine the price basis of all derivative reclaim grades. Every manufacturer produces a variety of special reclaims in each general group separately featuring characteristic properties of quality, workability, and gravity at special prices.

COTTON AND FABRICS

NEW YORK COTTON EXCHANGE
WEEK-END CLOSING PRICES

Futures	Nov. 26	Dec. 31	Jan. 7	Jan. 14	Jan. 21	Jan. 28
Mar.	29.91	30.78	30.93	30.90	31.03	31.36
May	29.88	30.61	30.90	30.93	31.10	31.34
July	29.61	30.00	30.50	30.52	30.66	30.75
Oct.	28.19	28.39	28.66	28.69	28.78	28.82
Dec.	28.12	28.28	28.53	28.60	28.68	28.73
Mar.	28.07	28.16	28.45	28.53	28.65	28.67

PRICES on the New York Cotton Exchange during January moved steadily higher because of active mill and export covering, despite several temporary hesitations caused by bearish elements. Of these factors, the more prominent have been the announced 25% cuts in ECA, not really effective yet since buying is still being done on old allocations, and the building up of mill stocks to a two-month supply level. The latter was expected to reduce mill purchasing of cotton, but good demand for mill goods has apparently offset any immediate possibility of a marked slump in this field. From Washington it was reported that the acreage bill was gaining headway in a move to increase the size of land in use for cotton from 21,000,000 acres to approximately 22,500,000 acres.

In the export field, new ECA allocations were announced during January, as follows: United Kingdom, $16,000,000; France, $5,000,000; French North Africa, $235,000; Belgium, $3,000,000; and Korea, $2,130,000. The 25% cut in ECA from its last allotment is expected to slash about 600,000 bales from export purchases.

The 15/16-inch middling spot price started the month at the low of 31.51¢, rose to a high of 32.29¢ on January 26 and 28, and ended the month at 32.23¢. March futures prices showed a corresponding advance from the low of 30.71¢ on January 3 to a high of 31.36¢ on January 26 and 28, and closed at 31.33¢ on January 31.

Fabrics

Wide industrial fabric mills reported good business during January, with orders running from 30-45 days ahead in most lines. Chafers, sateens, chafer fabrics, and numbered ducks were said to be selling into March. Wide and numbered ducks, while selling in less volume than the general run of industrial goods, were said to be in a healthy position with regard to inventory.

Print cloths reported most activity in spot and nearby sales at firm prices, although some inquiries were received into the third quarter. Improvement continued in hose and belting ducks, with mill stocks declining and orders increasing for the first quarter.

High raw cotton costs have forced cotton tire cords out of the market. Despite the looming shortage in rayon tire cords, most of the spinners formerly making cotton tire cords in large quantity will not reconvert to them unless the shortage becomes real and prolonged. In the third quarter of 1949, 29,104,000 yards of cotton tire cord and fabric were produced, as compared with 71,609,000 yards of rayon and nylon tire cord and fabric. This figure represents a loss for the cottons of 39% from the second quarter, and there is every indication that this trend continued during the fourth quarter.

Cotton Fabrics

Drills		
59-inch 1.85-yd.	yd.	$0.355 / $0.36
2.25-yd.		.31 / .32
Ducks		
38-inch 1.84-yd. S. F.	yd.	.425
2.90-yd. D. F.		.31 / .325
51.5-inch 1.35 yd. S. F.		.4375 / .46
66-inch 1.02-yd. S. F.		.73
Hose and belting		.60
Osnaburgs		
40-inch 2.11-yd.	yd.	.225
Raincoat Fabrics		
Bombazine, 64x60 5.35-yd	yd.	.215
Print cloth, 38½-inch, 64x60		.16¾
Sheeting, 48-inch, 4.17-yd.		.21
52-inch 3.85-yd.		.2225
Chafer Fabrics		
14-oz./sq. yd. Pl.	lb.	.635 / .65
11-65-oz./sq. yd. S.		.58 / .60
10-80-oz./sq. yd. S.		.62
8.9-oz./sq. yd. S		.635
14-oz./sq. yd. S		.59
Other Fabrics		
Headlining, 59-inch 1.35-yd. 2-ply	yd.	.565
64-inch 1.25-yd. 2-ply		.6063
Sateens, 53-inch 1.32-yd.		.57
58-inch 1.21-yd.		.6238
Tire Cords		
K. P. std., 12-3-3	lb.	.685
12-4-2		.675

RAYON

DESPITE an increasingly tight supply situation, high construction costs are said to prevent any substantial increases in rayon tire cord capacity during the near future. At current production and consumption rates, a shortage of 25,000,000 pounds of viscose high-tenacity rayon yarn used in making tire cord may arise in 1950. The supply scarcity should make itself felt by early March, market observers predict. While most rayon tire cord producers are expanding capacities of existing plants to meet this need, new plants are unlikely for the time being because of building costs and amortization difficulties.

According to producers, the following problems stand in the way of additional tire cord plants, estimated to cost about $25,000,000 each: (1) the possibility of shifting equipment from the production of viscose textile yarn to high-tenacity yarn; (2) uncertainty about the permanent size of the rayon tire cord market; and (3) the possibility that some tire manufacturers may build their own rayon plants. Another possibility is competition from nylon tire cord, although that material is relatively expensive at present. The possibility of tire manufacturers making their own rayon cord is not considered too great, owing to the long and costly problem of attaining the quality and efficiency of present rayon producers and the large outlay required for plant construction.

Current consumption of rayon tire cord and fabric is estimated at about 100,000,000 pounds a quarter. Production of rayon and nylon tire cord and fabric during the fourth quarter of 1949 was 72,000,000 pounds. Fourth-quarter figures are not available as yet, but there have been some increases in production although a good part of the increased demand has been satisfied out of producers' stocks.

No changes occurred in rayon tire yarn and fabric prices last month and current prices follow:

Rayon Prices

Tire Yarns		
1100/ 480	$0.55	
1100/ 490	.55	
1150/ 490	.55	
1650/ 720	.54	
1650/ 980	.54	
1900/ 980	.54	
2200/ 960	.53	
2200/ 980	.53	
4400/2934	.55	/ $0.56
Tire Fabrics:		
1100/490/2	.67	
1650/980/2	.645	/ .66
2200/980/2	.63	

United States Rubber Industry Employment, Wages, Hours

	Prod. Workers 1000's	Ave. Week. Earnings	Ave. Week. Hours	Ave. Hour. Earnings	Consumers Price Index
All Rubber Products					
1939	121	$27.84	39.9	$0.754	99.4
1943	194	....	....	....	133.5
1948					
Sept.	197	59.31	39.4	1.504	174.5
Oct.	198	59.19	39.3	1.507	173.6
Nov.	199	58.27	38.6	1.508	172.2
Dec.	196	57.68	38.5	1.499	171.4
1949					
Jan.	201	56.89	37.9	1.501	170.9
Feb.	197	56.55	37.5	1.500	169.0
Mar.	194	55.43	37.0	1.498	169.5
Apr.	190	55.50	36.9	1.504	169.7
May	185	57.08	37.7	1.514	169.2
June	181	58.29	38.2	1.526	169.6
July	177	58.37	38.4	1.520	168.5
Aug.	179	57.42	38.1	1.507	168.8
Tires and Tubes					
1939	54.2	$33.36	35.0	$0.957	
1943	90.1	....	....	....	
1948					
Sept.	91.4	65.27	37.7	1.732	
Oct.	90.0	64.82	37.2	1.734	
Nov.	91.2	62.79	36.2	1.735	
Dec.	89.6	61.10	35.6	1.721	
1949					
Jan.	91.3	60.72	35.3	1.720	
Feb.	89.4	60.99	35.8	1.723	
Mar.	88.6	61.50	35.4	1.718	
Apr.	88.6	60.92	35.4	1.721	
May	87.2	63.20	36.3	1.741	
June	86.3	64.09	36.6	1.751	
July	82.0	64.45	36.6	1.761	
Aug.	79.9	61.59	35.6	1.730	
Rubber Footwear					
1939	14.8	$22.80	37.5	$0.607	
1943	23.8	....	....	....	
1948					
Sept.	22.5	53.38	41.6	1.283	
Oct.	22.9	53.86	42.2	1.278	
Nov.	23.2	54.29	41.6	1.305	
Dec.	23.5	55.23	42.4	1.303	
1949					
Jan.	24.8	51.86	40.3	1.290	
Feb.	22.9	48.15	37.5	1.284	
Mar.	21.9	42.07	33.6	1.252	
Apr.	21.4	46.65	37.2	1.254	
May	20.5	48.39	38.5	1.257	
June	19.8	50.35	39.4	1.278	
July	20.2	48.84	38.7	1.262	
Aug.	20.3	48.86	38.9	1.256	
Other Rubber Products					
1939	51.9	$23.34	38.9	$0.605	
1943	79.9	....	....	....	
1948					
Sept.	82.9	54.35	40.8	1.333	
Oct.	84.7	55.08	40.8	1.350	
Nov.	84.5	54.61	40.5	1.347	
Dec.	82.6	54.49	40.5	1.346	
1949					
Jan.	85.3	54.38	40.1	1.356	
Feb.	85.1	54.05	40.1	1.348	
Mar.	83.1	52.49	39.2	1.339	
Apr.	79.6	51.69	38.4	1.346	
May	77.2	52.51	39.1	1.343	
June	75.3	53.85	39.8	1.353	
July	74.5	54.11	40.2	1.346	
Aug.	79.1	55.39	40.4	1.371	

SOURCE: BLS, United States Department of Labor, Washington, D. C.

STAMFORD "FACTICE" VULCANIZED OIL

(Reg. U. S. Pat. Off.)

Our products are engineered to fill every need in natural and synthetic rubber compounding wherever the use of vulcanized oil is indicated.

We point with pride not only to a complete line of solid Brown, White, "Neophax" and "Amberex" grades, but also to our aqueous dispersions and hydrocarbon solutions of "Factice" for use in their appropriate compounds.

Continuing research and development in our laboratory and rigid production control has made us the leader in this field.

The services of our laboratory are at your disposal in solving your compounding problems.

THE STAMFORD RUBBER SUPPLY COMPANY

Stamford, Conn.

Oldest and Largest Manufacturers of "Factice" Brand Vulcanized Oil Since 1900

Regular and Special Constructions of

COTTON FABRICS

Single Filling **Double Filling**

and

ARMY

Ducks

HOSE and BELTING

Ducks

Drills

Selected

Osnaburgs

Curran & Barry

320 BROADWAY

NEW YORK

United States Imports, Exports, and Reexports of Crude and Manufactured Rubber

Imports for Consumption and Manufactured Rubber	October, 1949 Quantity	Value
UNMANUFACTURED, Lbs.		
Crude rubber	100,019,146	$14,678,475
Rubber latex	5,899,732	1,213,360
Balata	600,606	142,538
Jelutong or Pontianak	278,558	92,681
Gutta percha	43,475	15,221
Chicle	106,167	95,307
Synthetic rubber	3,352,404	600,567
Scrap rubber	2,110,143	35,116
TOTALS	112,410,331	$16,873,265
MANUFACTURED		
Tires: auto, bus, truck *no.*	824	$4,040
Bicycle *no.*	1,025	519
Inner tubes, auto, etc. *no.*	136	228
Rubber footwear:		
Boots *prs.*	114,191	271,247
Shoes and overshoes *prs.*	19,167	26,152
Rubber-soled canvas shoes *prs.*	33,555	16,942
Athletic balls: golf *no.*	1,136	203
Other, except tennis *no.*	88,968	8,489
Rubber toys, except balloons	.....	26,979
Hard rubber products	.....	358
Rubberized printing blankets *lbs.*	465	1,583
Rubber gaskets and valve packing	.....	447
Insulators	.....	2,422
Belting *lbs.*	3,938	4,008
Hose and tubing	.....	970
Rubber instruments *doz.*	1,618	2,348
Gutta percha manufactures *lbs.*	1,700	1,220
Rubber bands *lbs.*	203	162
Synthetic rubber products	.....	471
Other soft rubber manufactures	.....	36,082
TOTALS	.....	$404,869
GRAND TOTALS, ALL RUBBER IMPORTS	.....	$17,277,134

Exports of Domestic Merchandise	October, 1949 Quantity	Value
UNMANUFACTURED, Lbs.		
Chicle and chewing gum bases	264,816	$107,636
Balata	1,413	4,836
Synthetic rubbers: GR-S	179,213	46,738
Butyl	100,000	18,125
Neoprene	533,887	179,903
Nitrile	128,165	63,034
"Thiokol"	800	424
Polyisobutylene	5,900	1,353
Other	4,250	5,040
Reclaimed rubber	2,480,653	184,997
Scrap rubber	1,555,909	39,973
TOTALS	5,255,006	$652,059
MANUFACTURED		
Rubber cement *gals.*	60,183	$117,330
Rubberized fabric: auto cloth *sq. yds.*	4,511	6,098
Piece goods and hospital sheeting *sq. yds.*	58,615	44,172
Rubber footwear:		
Boots *prs.*	8,193	30,484
Shoes and overshoes *prs.*	3,788	5,798
Rubber-soled canvas shoes *prs.*	7,917	14,212
Soles *doz. prs.*	32,330	89,162
Heels *doz. prs.*	37,525	31,648
Soling and toplift sheets *lbs.*	356,594	59,012
Gloves and mittens, *doz. prs.*	5,473	20,015
Drug sundries: hot water bottles and fountain syringes *no.*	39,811	22,621
Other	.....	163,497
Rubber and rubberized clothing	.....	63,776
Toy and novelty balloons	.....	51,148
Rubber toys and balls	.....	56,094
Erasers *lbs.*	24,707	14,072
Hard rubber goods: battery boxes *no.*	33,179	42,356
Other electrical goods, *lbs.*	90,536	88,928
Combs, finished *doz.*	3,618	3,441
Other	.....	5,763
Tires and casings: truck and bus *no.*	94,581	3,552,425
Auto *no.*	56,249	666,722
Aircraft	.....	85,509
Farm tractor, etc. *no.*	5,804	203,388
Other off-the-road *no.*	1,685	171,641
Bicycle *no.*	6,865	7,751
Motorcycle *no.*	83	653
Other *no.*	2,019	33,655
Inner tubes: auto, truck, bus *no.*	104,742	288,074
Other *no.*	6,459	28,403
Solid tires: truck and industrial *no.*	1,773	115,180
Other *lbs.*	4,516	2,612
Tire repair materials:		
Camelback *lbs.*	138,252	38,293
Other *lbs.*	150,629	105,977
Rubber and friction tape *lbs.*	30,833	20,641
Belting: auto and home *lbs.*	79,759	91,541
Transmission: V-belts *lbs.*	91,187	138,941
Flat belts *lbs.*	45,510	50,311
Other *lbs.*	28,546	26,844
Conveyer and levitator *lbs.*	25,957	23,719
Other *lbs.*	11,149	17,820
Hose and tubing *lbs.*	358,221	280,659
Packing *lbs.*	99,064	109,264
Mats, flooring, tiling *lbs.*	656,470	149,570
Thread: bare *lbs.*	23,817	32,006
Textile covered *lbs.*	13,670	31,886
Gutta percha manufactures *lbs.*	2,067	1,802
Latex and other compounded rubber for further manufacture *lbs.*	366,442	109,421
Other natural and synthetic rubber manufactures	.....	359,613
TOTALS	.....	$7,673,948
GRAND TOTALS, ALL RUBBER EXPORTS	.....	$8,326,007

Reexports of Foreign Merchandise	October, 1949 Quantity	Value
UNMANUFACTURED, Lbs.		
Crude rubber	904,305	$164,047
Balata	10,651	4,464
TOTALS	914,956	$168,511
MANUFACTURED		
Rubber cement *gals.*	165	$135
Footwear: boots *prs.*	24	109
Gloves and mittens *doz. prs.*	100	480
Drug sundries, except syringes and hot water bottles	.....	147
Rubber toys and balls, except balloons	.....	9,925
Tires and casings: auto *no.*	12	218
Aircraft	.....	500
Rubber packing *lbs.*	1,288	793
Other natural and synthetic rubber manufactures	.....	124
TOTALS	.....	$12,431
GRAND TOTALS, ALL RUBBER REEXPORTS	.....	$180,942

SOURCE: Bureau of Census, United States Department of Commerce, Washington, D. C.

United States Rubber Statistics—October, 1949

(All Figures in Long Tons, Dry Weight)

	New Supply: Production	Imports	Total	Distribution: Consumption	Exports	Month-End Stocks
Natural rubber, total	0	44,651	44,651	47,284	404	86,258
Latex, total	0	2,634	2,634	3,959	0	4,475
Rubber and latex, total	0	47,285	47,285	51,243	404	90,733
Synthetic rubber, total	*22,937	1,497	29,512	33,687	420	103,955
	†5,078					
GR-S	*19,735	1,339	21,784	25,817	80	83,750
	†710					
Neoprene	†3,206	0	3,206	2,714	238	3,985
Butyl	*3,202	158	3,360	4,151	45	12,817
Nitrile	†1,162	0	1,162	1,005	57	3,403
Natural rubber and latex, and synthetic rubber, total	28,015	48,782	76,797	84,930	824	194,688
Reclaimed rubber, total	20,683	0	20,683	19,638	1,107	26,619
GRAND TOTALS	48,698	48,782	97,480	104,568	1,931	221,307

*Government plant production.
†Private plant production.
SOURCE: Rubber Division, ODC, United States Department of Commerce, Washington, D. C.

Estimated Automotive Pneumatic Casings and Tube Shipments, Production, Inventory, November, October, 1949; First 11 Months, 1949-1948

	November, 1949	% of Change from Preceding Month	October, 1949	First Eleven Months, 1949	First Eleven Months, 1948
Passenger Casings					
Shipments					
Original equipment	1,577,625		2,711,781	26,195,446	19,691,908
Replacement	2,752,081		3,004,533	34,148,795	38,945,329
Export	41,363		68,371	464,970	583,727
TOTAL	4,371,069	−24.44	5,784,685	60,809,205	59,220,964
Production	5,135,411	− 8.64	5,621,182	59,859,872	62,141,349
Inventory end of month	7,867,378	+12.14	7,015,899	7,867,378	8,515,885
Truck and Bus Casings					
Shipments					
Original equipment	168,710		229,839	3,206,848	4,854,270
Replacement	669,646		735,412	6,419,011	7,250,214
Export	57,989		89,668	872,994	1,014,783
TOTAL	896,345	−15.03	1,054,919	10,498,853	13,119,267
Production	904,388	+ 2.91	878,835	10,213,587	13,471,147
Inventory end of month	1,674,616	+ 0.94	1,658,983	1,674,616	1,960,266
Total Automotive Casings					
Shipments					
Original equipment	1,746,335		2,941,620	29,402,288	24,546,178
Replacement	3,421,727		3,737,945	40,567,806	46,195,543
Export	99,352		158,039	1,337,964	1,598,510
TOTAL	5,267,414	−22.99	6,839,604	71,308,058	72,340,231
Production	6,039,799	− 7.08	6,500,017	70,073,459	75,612,496
Inventory end of month	9,541,994	+10.00	8,674,882	9,541,994	10,467,151
Passenger and Bus and Truck Tubes					
Shipments					
Original equipment	1,745,782		2,940,439	29,348,046	24,542,967
Replacement	2,415,209		2,538,032	29,944,667	38,236,935
Export	55,428		78,633	833,757	995,939
TOTAL	4,216,419	−24.13	5,557,104	60,126,470	63,775,841
Production	5,154,605	− 2.66	5,295,630	60,256,914	65,000,894
Inventory end of month	9,645,004	+11.58	8,643,678	9,645,004	9,303,066

NOTE: Cumulative data on this report include adjustments made in prior months.
SOURCE: The Rubber Manufacturers Association, Inc., New York, N. Y.

CLASSIFIED ADVERTISEMENTS

Continued

SITUATIONS WANTED (Continued)

RUBBER CHEMIST, 20 YEARS' WIDE EXPERIENCE IN COMpounding, raw materials, and all factory operations, is looking for new connection. 45 years old. Ph. D. Factory, laboratory, or technical sales. Address Box No. 499, care of INDIA RUBBER WORLD.

GRADUATE CHEMIST, MANY YEARS' EXPERIENCE AS CHIEF chemist and superintendent of three progressive companies. Last ten years with large company over rubber research and development, also assistant in friction material on compounds and production methods. Address Box No. 500, care of INDIA RUBBER WORLD.

SUPERINTENDENT-CHEMIST DESIRES NEW CONNECTIONS. Capable manager's assistant-technical manager of production or executive supervisor. Background is 24 years of intensive activity in all phases of manufacture of all types of mechanical and sponge rubber products using crude-synthetic-reclaim rubbers. Chemical-mechanical engineer. Address Box No. 501, care of INDIA RUBBER WORLD.

RUBBER CHEMIST SEEKS CONNECTION WITH STABLE progressive firm. Eight years' experience in hose and belt compounding and design. Supervisory experience. Age 34. Address Box No. 502, care of INDIA RUBBER WORLD.

CHEMICAL ENGINEER—RUBBER CHEMIST: 15 YEARS' INdustrial experience, 11 years as compounder and chief chemist in rubber industry. Solid background of development compounding, factory trouble shooting, and raw materials' experience in mechanical rubber goods. Age 36, married, family. Desire new connection with stable, progressive company in South or Southwest location. Address Box No. 504, care of INDIA RUBBER WORLD.

MACHINERY & SUPPLIES FOR SALE

FOR SALE: 1—22" x 60" ERIE MILL WITH DRIVE AND motor. 4 years old; 3—24" x 60" 3-roll Calenders with drives and variable speed D. C. motors; 1—48" x 48" Hydraulic Press 3-opening, other presses various sizes; 1—5' x 24' Vulcanizer, 100# pressure, quick-locking door. 6 Royle and other Tubers 2-1/8" to 8". Also Mills, Calenders, etc. Send us your inquiries. CONSOLIDATED PRODUCTS CO., INC., 13-16 Park Row, New York 7, N. Y. Phone: BArclay 7-0600.

TWO LEAD-COATED METAL LATEX CIRCULATING DIPPING tanks without accessories for sale. AMERICAN MEDICAL SPECIALTIES CO., 12 East 12th Street, New York, N. Y. GRamercy 3-2112.

FOR SALE: COMPLETE EQUIPMENT FOR MANUFACTURING tires and tubes, in very good condition; some machines like new, having been used only a few times. This equipment produces 300 tires and 300 inner tubes a day. Also are included a new 66" calender and a 60" mill for plastics work. Write for detailed information to HULE & LATEX, S. A., Privada Cervantes Saavedra 15, Col. Anahuac., P. O. Box 28917, Mexico 17, D. F., Mexico.

FOR SALE

1 — Laboratory size heavy duty double arm jacketed mixer — interchangeable rotors and covers.

4 — Heavy duty double arm jacketed mixers: Day 25 gal., W.&P. 100 gal., Read 150 gal.

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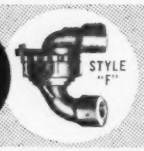

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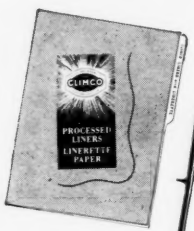

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